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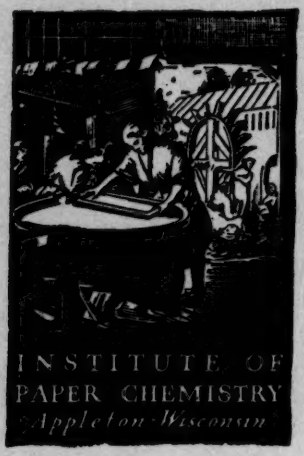
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

MAY · 1950

Volume 20 Number 9

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Books and Pamphlets Added to the Library During April

AIR CONDITIONING

ROBINSON, KARL DAVIS, comp. What the lithographer should know about air conditioning (superseding Handbook of air conditioning for lithographers, 1929). New York, Lithographic Technical Foundation Inc. [c1950] 92 p.

CHEMICAL ENGINEERING

PERRY, JOHN H., ed. Chemical engineer's handbook, prepared by a staff of specialists. 3d ed. New York, McGraw-Hill Book Co., 1950. 1942 p.

CHEMICAL TESTS AND REAGENTS

SMITH, G. FREDERICK. Analytical applications of periodic acid (H_5IO_6) and iodic acid (HIO_3) and their salts. 5th ed., rev. Columbus, Ohio, The G. Frederick Smith Chemical Co., 1950. 108 p.

CHEMISTRY, PHYSICAL AND THEORETICAL

SURFACE CHEMISTRY; papers presented for a discussion at a joint meeting of the Société de chimie physique and the Faraday Society held at Bordeaux from 5 to 9 October 1947 in honour of professor Henri Devaux, published as a special supplement to *Research*, a journal of science and its applications. New York, Interscience Publishers, 1949. 334 p.

CHEMISTRY, PHYSICAL AND THEORETICAL—LABORATORY MANUALS

WEISSBERGER, ARNOLD, ed. Physical methods of organic chemistry. 2d compl. rev. and augm. ed. New York, Interscience Publishers, 1949. Part 2. p. 1073-2096.

ELECTRIC MACHINERY

ROBERTSON, B. L., and BLACK, L. J. Electric circuits and machines. New York, Van Nostrand [c1949] 434 p.

ELECTRON MICROSCOPE

WYCKOFF, RALPH W. G. Electron microscopy, technique and applications. New York, Interscience Publishers, 1949. 248 p.

FOREST INSECTS

CRAIGHEAD, F. C. Insect enemies of eastern forests. U. S. Dept. of Agriculture. Miscellaneous publication no. 657. Washington, U. S. Govt. Print. Off., 1950. 679 p.

FOREST PRODUCTS

PANSHIN, A. J., HARRAR, E. S., BAKER, W. J., and PROCTOR, P. B. Forest products, their sources, production, and utilization. New York, McGraw-Hill Book Co., 1950. 549 p.

FORESTS AND FORESTRY—MENSURATION

CHAPMAN, HERMAN H., and MEYER, WALTER H. Forest mensuration. New York, McGraw-Hill Book Co., 1949. 522 p.

MATERIAL HANDLING

SOCIETY OF INDUSTRIAL PACKAGING AND MATERIALS HANDLING ENGINEERS. Proceedings; papers presented at the Packaging and Materials Handling Institute, held at Detroit, Michigan, October 3-7, 1949, conducted by The Society under auspices School of Business Administration, Wayne University, comprising the educational program, fourth annual industrial packaging and materials handling exposition. Chicago, The Society [c1949] 222 p.

MINES AND MINERAL RESOURCES

[U. S. BUREAU OF MINES] Minerals yearbook, 1947. Prepared under the direction of E. W. Pehrson; Allan F. Matthews, editor. [Washington, U. S. Govt. Print. Off., 1949] 1616 p.

PAPER—SAMPLE BOOKS

THE NATIONAL ASSOCIATION OF PAPER MERCHANTS. Students' sample book. London, The Association [1949] 85 samples.

PAPER MAKING AND TRADE

GUTHRIE, JOHN A. The economics of pulp and paper. Pullman, Washington, The State College of Washington Press [c1950] 194 p.

PAPER SPECIALTIES

The PAPER year book, 1950 edition. Anita Reinig, editor. [8th annual ed.] Duluth, Minn., Davidson Publishing Co., c1950. 583 p.

PETROLEUM

STANDARD OIL COMPANY OF NEW JERSEY. Technical publications, 1947. [n.p., The Company, c1950] 499 p.

PRINTING

The PENROSE ANNUAL, a review of the graphic arts. Ed. by R. B. Fishenden. New York & London, Pitman Publ. Corp. [c1950] v. 44. 140 p. + numerous examples.

STATISTICS

BROWNLEE, K. A. Industrial experimentation. 3d Am. ed., compl. rev. and enl. New York, Chemical Publ. Co., 1949. 194 p.

WATER—POLLUTION

GREAT BRITAIN. *Department of Scientific and Industrial Research. Water Pollution Research Board.* Report of the Water Pollution Research Board, with the report of the director of Water Pollution Research for the year 1948. London, H. M. Stationery Office, 1949. 56 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

ROWEN, JOHN W., and PLYLER, EARLE K. Effect of deuteration, oxidation, and hydrogen-bonding on the infrared spectrum of cellulose. J. Research Natl. Bur. Standards 44, no. 3: 313-20 (March, 1950); *cf.* B.I.P.C. 18: 79.

Regenerated cellulose films were immersed in heavy water (99.58% deuterium oxide) at temperatures up to 52° C. for as long as 100 hours in an attempt to effect a substitution of deuterium for the hydrogen in the hydroxyl groups of the cellulose. The intensity of the hydroxyl vibration in the 3-micron region of the spectrum of the films decreased very little. A weak oxygen-deuterium vibration appeared in the 4-micron region. The results indicate that only a small fraction of the hydroxyl groups of the cellulose participated in an exchange under the conditions of the experiments. The infrared spectra from 2 to 16 microns of cellulose nitrate, nitrogen dioxide-oxidized cellulose, alginic acid, and sodium alginate are recorded. A comparison of the spectra of these polysaccharides indicates that the strong band at 5.75 microns in the spectrum of the oxidized cellulose is caused by the $C=O$ vibration of the carboxyl group, and that the bands at 6.07 and 7.01 microns are caused by nitrogen-oxygen vibrations. The intense bands in the 3-micron region of the spectra of a number of cellulose derivatives, attributed to hydroxyl groups, were examined with the aid of the high-dispersion lithium fluoride prism. The minima of the bands were exactly at or close to 2.86 microns (3500 $cm.^{-1}$). The possibility of the existence of a common type of hydrogen bond in the cellulose derivatives is discussed. 7 figures and 18 references. E.S.

ADHESIVES

ANON. Taping joint with ungummed tape. Fibre Containers 35, no. 4: 82, 84-6 (April, 1950).

Reference is made to a new method of taping the manufacturer's joint of corrugated boxes by using Darex (made by Dewey and Almy), a synthetic resin emulsion adhesive, which is applied to the ungummed tape made of kraft, cloth, or a special glass fabric-reinforced kraft. Automatic taping machines can be readily converted to the new process by exchanging the water box of conventional taping machines with a Darex applicator; the entire conversion requires less than three hours. Production speeds are equal to those obtained with gummed tape. The resin can be washed off the adhesive-applying equipment with ordinary tap water while it is still wet, so that cleaning after a day's work does not present any difficulties. The adhesive runs at room temperature, is extremely fast setting, and insoluble in water when dry. 2 illustrations. E.S.

GABRIEL, ARTHUR E. Adhesive developments important factor in packaging research. Packaging Parade 18, no. 207: 112-16, 118-19 (April, 1950).

Many of the recent developments and improvements in packaging have been made possible largely by new adhesives and coating materials on the

market. The new synthetic glues have many distinct advantages over the older glues (starch, animal, casein, silicate of soda, blood, and soybean), such as improved water resistance, lower vapor transmission, more uniform quality, inherent resistance to organisms, and higher temperature resistance. The older types, however, are generally more economically and easily applied, and they are by no means disappearing from use. Polyethylene, thermosetting adhesives, synthetic rubbers, and polyvinyl acetate emulsions are among the synthetic adhesives mentioned, and their uses, restrictions, and relative advantages are discussed. Manufacturers may be aided in their selection of adhesives by private testing laboratories and research organizations.

J.A.B.

ALKALINE PROCESSES—RECOVERY

TROBECK, KARL GUSTAF. The BT-system for soda and heat recovery in sulphate pulp mills. Paper Trade J. 130, no. 16: 40, 42, 44, 46, 48 (April 20, 1950); *cf.* B.I.P.C. 20: 468.

This is an extended translation of the Swedish article. 2 tables and 8 figures. E.S.

ASSOCIATIONS

HOOD, NORMAN. Research Association progress. World's Paper Trade Rev. 133, no. 7: 424, 426, 428 (Feb. 16, 1950); Paper-Maker (London) 119, no. 2: 85-6 (February, 1950).

The fifth annual report of the British Paper and Board Industry Research Association is presented, covering the period from October 1, 1948 to September 30, 1949, so that the fire which occurred in November, 1949 took place after the close of the year under review; however, reference is made to its occurrence. The excerpts given in the two periodicals do not cover the identical material and supplement one another. The first reference deals with the general association activities and matters, such as finance, membership, committees, visitors, staff changes, etc.; in the second, the research progress is discussed under the headings: raw materials, effluent, bleaching, beating, sizing, varnishing, water removal by mechanical means, drying by heat, and paper testing methods. E.S.

KOLLMANN, FRANZ. Fiberboards and wood-waste boards. Svensk Papperstidn. 53, no. 4: 103-9 (Feb. 28, 1950). [In German; English and Swedish summaries]

A report is presented of the meeting of the executive committee Holzfaser- und Holzspanplatten of the Deutsche Gesellschaft für Holzforschung, which was held in Braunschweig, October 18, and 19, 1949; abstracts of the papers are included. (*cf.* also Stegmann, Wochbl. Papierfabr. 77. no. 17: 479-81 [Dec. 15, 1949]). E.S.

BACTERIOLOGY

HUNGATE, R. E. The anaerobic mesophilic cellulolytic bacteria. Bact. Revs. 14, no. 1: 1-49 (March, 1950).

The author gives in detail the isolation technique used in collecting the bovine rumen fluid, and the various aspects of isolating the cellulolytic bacteria in pure culture from this collected fluid. The author reports also that he has successfully isolated nonspore-forming cellulolytic bacteria from sewage sludge, soil, and the rumen of cattle; cellulolytic cocci from the rumen of cattle; and cellulolytic spore-forming rods from soil, sewage, manure, river mud, and the contents of the alimentary tract of various animals. In studying the ecology of the cellulolytic organisms, the author believes that

they are symbionts which have undergone a period of evolution in the host. These organisms grow best when rumen fluid is included in the medium; as a matter of fact, most strains require it for their normal growth and reproduction. The present investigations indicate that the cellulolytic organisms isolated do not appear to have industrial applications, first, because of their slow fermentation rate and second, because the small concentration of fermentation products precludes their economic recovery; in addition, the variety of fermentation types discovered is not very great. Most of the strains isolated produce the usual end products, such as hydrogen, carbon dioxide, ethanol, and formic, acetic, lactic, and succinic acids. 9 tables, 8 figures, and 47 references. B.F.S.

McBEE, R. H. The anaerobic thermophilic cellulolytic bacteria. Bact. Revs. 14, no. 1: 51-63 (March, 1950).

The author has studied the available cultures of thermophilic, cellulose-fermenting bacteria and has shown that it is possible to obtain pure cultures of these organisms. These cultures apparently are very stable, since some of the isolates have not changed either morphologically or physiologically after two years of growth on cultural media in the laboratory. The nutrient requirements of these organisms are relatively simple. The author states that other organisms have an inhibitive effect rather than a stimulative effect as reported by Imsenecki. He suggests that all the cultures of anaerobic thermophilic cellulose-fermenting organisms be included or considered as strains of *Clostridium thermocellum*. 1 table and 63 references. B.F.S.

BAGASSE

ANON. Newsprint from bagasse—a sugar cane residue. Chemurgic Digest 9, no. 3: 8-10 (March, 1950); *cf.* B.I.P.C. 20: 468-9.

With reference to the experimental newsprint made from bagasse by the Timlowski technique, the description of this event and the evaluation first published in *Paper Trade Journal* are printed here on paper made from bagasse. 2 illustrations. E.S.

BARK

KURTH, E. F., HUBBARD, JAMES K., and GEKELER, MAURICE. Extraction of tannin from Douglas-fir bark and concentration of the tan liquor. Leather and Shoes 118, no. 20 and 22: 6 p. (Nov. 5, 19, 1949); Chem. Eng. News 28, no. 20: 1656 (May 15, 1950). [Abridgment]

The tannin content of sound Douglas fir bark was found to range from 7.6 to 18.3%, depending upon the age of the trees. The highest content was found in the bark of young trees; maximum tannin content was found to develop soon after drying the fresh bark. The tannin belongs to the phlobotannin class of tannins. In addition to tannin, the bark contains the flavanone dihydroquercetin, and two kinds of waxes in appreciable quantities. Quercetin has been isolated from the insoluble fraction in concentrated aqueous tannin extracts. An integrated tannin and wax extraction is feasible, because the two extractions do not interfere with each other; however, a circumstance adversely affecting such an integrated operation is the fact that bark with the highest tannin content has the least amount of wax. Data on tannin extraction, concentration, and buffering with sodium sulfite or sodium carbonate are given. Sheepskin skivers were tanned a uniform light-yellow color with the sulfite-treated liquor, whereas the carbonate-treated liquor produced a uniform light-brown color. 11 tables, 1 figure, and 5 references. E.S.

KURTH, E. F., HUBBARD, JAMES K., and HUMPHREY, JANE D. Chemical composition of ponderosa and sugar pine barks. Proc. Forest Products Research Soc. 3: 276-82 (1949); Paper Trade J. 130, no. 17: 37-8, 40, 42 (April 27, 1950).

The authors summarize the findings on the chemical analyses of the bark from ponderosa pine (*Pinus ponderosa* Laws.) and from sugar pine (*Pinus lambertiana* Dougl.). Bark of the ponderosa pine was found to contain 23.2 to 28.7% extractives, with the highest yield obtained from the bark at the bottom of the oldest trees. Tannin content ranged between 5.6 and 11.4% and appears to have possibilities for commercial extraction and utilization. Other extractives include a lignocerate wax, a phenolic-fatty acid complex and a flavanol yellow coloring matter. There are at least two types of materials in the bark which appear as "lignin," and these are significantly different from wood lignins. Chemically these "lignin" components are similar to those found in redwood bark. The sugar pine bark contained approximately 21 to 22% of extractives. The tannin content ranged between 4.9 and 7.1% and the wax content between 2.2 and 3.1%. The major extractive was a reddish-brown phlobaphene; the minor extractives were lignoceric acid and an alcohol that sublimed above 305° C. 8 tables, 1 figure, and 9 references. E.S.

KURTH, E. F., and KIEFER, H. J. Wax from Douglas-fir bark. Tappi 33, no. 4: 183-6 (April, 1950).

A major constituent of the extractives from Douglas fir bark is a hard nontacky wax. Other commercially important extractives present in this bark are tannin and dihydroquercetin. The present paper gives data on the optimum conditions for the extraction of the bark and the chemical composition, properties, and yields of the wax. The wax soluble in benzene and chlorinated aliphatic hydrocarbon-type solvents amounts to 5 to 10% of the weight of the dry bark, and is readily separated into two fractions with aliphatic hydrocarbon-type solvents. The fraction soluble in hot hexane is a light-colored wax consisting of approximately 20% lignoceryl alcohol, 60% lignoceryl acid, and 20% ferulic acid (4-hydroxy-3-methoxycinnamic acid). The fraction insoluble in hexane is a light-brown to reddish-brown material, which on saponification gave a fatty acid mixture in about 25% yield, a dark-colored phlobaphene in 24% yield, an ethyl ether-soluble acid fraction in 26% yield, unsaponifiable matter in 5% yield, and glycerol. 5 tables, 2 figures, and 7 references. E.S.

LEWIS, HARRY F. Utilization of redwood bark. Proc. Forest Products Research Soc. 3: 179-84; discussion: 84-7 (1949); Paper Trade J. 130, no. 14: 18-20, 22 (April 6, 1950).

The author summarizes the work done to date on the utilization of redwood bark by The Institute of Paper Chemistry and The Pacific Lumber Company. The mechanical separation of the bark into "fiber" and "dust" fractions and the chemical and physical properties of the fractions are given. Experiments on the use of bark fiber in low quality papers, fillers, plastics, loose-fill insulation, and textiles are described. The use of the "dust" fraction as a filler for plastics and as a substitute for peat moss, and problems involved in such use are given. The low methoxyl content of redwood bark lignin as compared with the methoxyl content of wood lignin and the production of sodium palconate from the acid fraction of the bark are likewise described. 9 references. E.S.

BARKERS AND BARKING

HILL, L. E. Hydraulic barking—a summary. Tappi 33, no. 4: 72-82A (April, 1950); *cf.* B.I.P.C. 20: 305.

This is the complete text of the paper. 1 table and 14 references. E.S.

BEATING

TOLVI, ERKKI. The beating of kraft paper. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 3: 65-8 (March, 1950). [In Finnish. English summary] *cf.* B.I.P.C. 18: 653.

Laboratory investigations have shown that the beating rate decreases, regardless of pulp quality, when the temperature of the pulp suspension is increased. Temperature increases also result in changes in the physical properties of the paper, because pulps swell to different extents at different temperatures; the differences in swelling, in turn, are caused by changes in the surface tension of the water in which the pulp is suspended. The surface tension decreases with increasing temperature, resulting in decreased swelling of the fibers and a lower beating rate. Beating tests with sulfate pulps in laboratory and mill beaters and jordans showed that the beating rate decreased under laboratory as well as under mill conditions; this causes a considerable increase in power consumption. Hence, the cooling of the beating units should be considered (*cf.* B.I.P.C. 19: 754-5). The strength properties of paper increase to a certain extent at a lower beating temperature. 3 tables and 16 curves. E.S.

BENTONITE

GRUNER, E., and VOGEL, R. E. Swelling behavior of bentonite; dependence on sorption of cations. Kolloid-Z. 116, no. 2: 88-99 (February, 1950). [In German]

Viscous slips are formed by mixing bentonite with solutions of alkali or alkaline earth hydroxides. The viscosity of the slips is dependent upon the concentration of alkali. It appears from the shape of the viscosity *vs.* alkali concentration curves that two separate processes are opposing each other: (1) viscosity reduction as a result of hydroxyl-ion adsorption (this effect is already known for kaolin); and (2) swelling as the result of adsorption of water in silicon-oxide layers of the montmorillonite lattice. Water adsorption is largely dependent upon total cation concentration and the basicity of the hydroxide, i.e., upon chemisorption prevailing in the bentonite-alkali system. Hydration of the adsorbed cations causes increased transfer of water into the planes and thus increased swelling. Increased alkalinity of the hydroxide causes increased chemisorption and thus diminished swelling. The shape of the viscosity *vs.* alkali concentration curve results from the combination of three factors: viscosity reduction, swelling by hydration of cations, and reduction of swelling by chemisorption. A comparison of the viscosity curves for kaolin-alkali slips of Lottermoser and Schmidl (*cf.* Z. anorg. Allgem. Chem. 203: 129-45 [1931]) shows substantial agreement with those of this research for bentonite. 4 tables, 10 figures, and 43 footnotes. A.M.B.

BIOGRAPHY

CARRUTHERS, GEORGE. Hugh Burgess, wood pulp pioneer. Paper-Maker (London) 119, no. 2: 94-5 (February, 1950); *cf.* B.I.P.C. 20: 392.

The biography of Hugh Burgess, 1824-92, the inventor of the soda process, is presented. The article is taken from the author's book "Paper in the making," Toronto, Garden City Press, 1947. E.S.

BOARD

ANON. Scoring, slotting, bending, creasing, and beading; the

problem of creating an unequivocal technical terminology. Allg. Papier-Rundschau no. 2: 46, 48-51; correction: no. 7: 344 (Jan. 30, April 15, 1950). [In German]

Supplemented by 13 figures, the different procedures for obtaining satisfactory bending or creasing of boxboard are discussed. The influence of the grain of the board on these operations is mentioned. E.S.

KOTTE, HANS. Paper for lamination. Allg. Papier-Rundschau no. 16: 771-5 (Dec. 15, 1949). [In German]

The development of paper lamination and the different modern laminated papers and boards are discussed briefly. Types of adhesives are mentioned, with particular reference to the Stein-Hall procedure (*cf.* B.I.P.C. 18: 470-1) and the water-soluble vinyl adhesives for waterproof containers, developed by Du Pont during the war, and their peacetime applications. The construction principles of two laminating machines are described by means of two models (for two and five plies) developed by the John Waldron Corp. In conclusion, brief reference is made to paper-base plastics and the requirements of the base paper. 6 figures. E.S.

BOARD—CONVERSION

PP. Lamination. Allg. Papier-Rundschau no. 17: 825-6 (Dec. 30, 1949). [In German]

Of the three principal procedures for laminating sheet to sheet, roll to sheet, and roll to roll, the small paper converter is only interested in the first method. Directions for the correct pasting of board to board and paper to board by manual or machine operation are given, with brief reference to adhesives and the advantages to be derived from the broad experience of the adhesive manufacturer, who should be consulted. E.S.

REININGER, H. Metal spraying for the impregnation of board. Allg. Papier-Rundschau no. 16: 776-7 (Dec. 15, 1949). [In German]

The unsuitability of metal spraying for the impregnation of board in the place of paraffin for waterproofing is emphasized. The procedure is suitable for advertising purposes, stiffening stage and show-window decorations, and certain electrical applications; a Swiss suggestion proposes the metallizing of banknotes to make them noncombustible and less subject to wear. 3 figures. E.S.

BOARD—DEFECTS

SMITH, S. F. Dried-in strains in paper sheets and their relation to curling, cockling and other phenomena. Paper-Maker (London) 119, no. 3: 185-8, 190-2 (March, 1950); Can. Pulp Paper Ind. 3, no. 5: 10-15, 29-30 (May, 1950).

The present investigation was started to determine the mechanism of curling when paperboard is enamel coated; although the board may be quite flat before coating, it is very liable to acquire a curl as it dries, particularly if the board is thin. The curl appears always toward the coated side; the tendency of the sheet is to take the form of a cylindrical surface with the axis of the cylinder in the machine direction (cross-machine curl). On drying, the coating material, which is a water paint, produces a contraction of the board surface. If the same amount of water per unit area as was contained in the coating is applied, the identical degree of curling appears, establishing the water content of the mixture as the responsible shrinking agent. When very narrow strips (about a quarter of an inch) were cut in

the machine and cross-machine directions, it was found that a lesser machine-direction shrinkage also existed, which became apparent in the narrow strips, but which was masked in wider boards by the stronger cross-machine shrinkage. Hence, apparent and suppressed surface contractions are the cause of the curls. A method for measuring the contractions in the top layer (liner) of the board is described. A thin sheet of tissue is inserted between the outermost ply and the ply below as the board is formed on the machine, so that the liner can be peeled off the tissue intact. Strips about one inch thick were cut from this liner in both directions and conditioned in the humidity room. A reference mark was made at the end of each strip, the distance between the marks was measured with a steel rule, the strips were wetted in a specially designed apparatus with a uniform film of water, allowed to dry in the atmosphere of the humidity room, and the length between the marks was remeasured. The agreement between measured shrinkages and those calculated from the curl is remarkably close for both directions. A comparison between exposure to a very humid atmosphere and water showed that small contractions may occur as a result of the former; however, water is required to develop the contraction responsible for the curl. Paper sheets tend to shrink when drying from the wet state in which they are formed. The shrinkage is greater in the cross-machine than in the machine direction, greater for beaten than for unbeaten stock and, in general, greater for beaten chemical pulps than for mechanical wood pulps. On the paper or board machines the shrinking tendency is resisted in various ways (tension of the sheet over the drier section, frictional adhesion of the sheet to the drier surfaces and drier felts, adhesion to the M.G. cylinder, etc.), so that the actual shrinkage is always less than the potential one. Accordingly, every sheet of paper (with the exception of loft-dried) will have a dried-in strain in each of the directions which can be quite large; up to 9% has been recorded in the present study. A special reason for dried-in strains in boxboard is the difference in the potential shrinkage of the various plies; the liner may be well-beaten chemical wood pulp (9-10% shrinkage) and the remaining plies mechanical wood pulp (2% shrinkage). Whatever the width of the final sheet, there is bound to be a fairly large strain in the liner or in the other plies. Data are given to show that the shrinkage on wetting and drying is much less than the total dried-in strain and parallels closely the values in both machine directions. The cross-machine direction shrinkages are always much larger and more important. If wetting and drying cycles are carried out, and the sheet is allowed to dry freely, a further contraction occurs each time, but decreases in size with each successive wetting and drying. If the sheet is not allowed to dry freely, the contractive tendency is preserved unimpaired for a large number of cycles. The range of contractions on similar sheets, even if made on the same machine, is very large; the differences are caused by quite small variations in the beating degree of the stock. The fiber structure and the anisotropic behavior of the fiber on swelling are given as the primary causes of shrinkage and dried-in strains; present results confirm previous data given by Weidner (*cf.* B.I.P.C. 9: 238). Examples are listed of other cases of recoverable dried-in strains on wetting and drying (the curling of lithographic paper, the change in dimensions of photographic base paper, the control of curling of paperboard on water-finish machines, etc.). In conclusion, a theory of cockling in paper and paperboard based on the phenomena of dried-in strains is presented. 4 tables, 6 figures, and 4 references. E.S.

BOARD MILLS

FIBRE CONTAINERS. Weyerhaeuser's new Springfield board mill. Fibre Containers 35, no. 4: 30, 32, 37-8, 40 (April, 1950); *cf.* B.I.P.C. 20: 384.

An illustrated description of the new board mill is given. E.S.

PULP & PAPER. Macon kraft mill; new and unusual features added. Pulp & Paper 24, no. 4: 28, 30, 32, 35-6 (April, 1950); *cf.* B.I.P.C. 19: 690.

The Macon Kraft Co. has now been in operation for over a year. An illustrated description of the mill and some of the unusual features of the equipment is given. New equipment installed during the past year includes a lime saver made by the American Air Filter Co., and a pulpwood stacker operated in conjunction with a flume. 13 illustrations. E.S.

CELLOPHANE

ANON. "Bacon and eggs." Modern Packaging 23, no. 8: 148-50 (April, 1950).

The new bacon wrapper introduced by John Morrell & Co., Ottumwa, Iowa, reflects some of the meat industry's most advanced theories on bacon merchandising. The LSAT cellophane wrapper has been found to keep sliced bacon in salable condition two or three times as long as PT cellophane by reducing dehydration and retarding light discoloration to some extent by lowering the oxygen transmission. The front panel design includes a full-color illustration of a platter of bacon and eggs, as well as a transparent window more than five inches wide to permit visual inspection. The bacon slices, which are weighed by hand, are placed on a grease-resistant backing board, then conveyed to an automatic wrapping machine, the first of its kind in use. The wrapper is supplied in continuous rolls and is automatically cut to length with electric-eye registration, then heat-sealed, but not evacuated. The machine will accommodate a maximum of 30 packages per minute, in either ½- or 1-pound units. 1 sample wrapper and 8 illustrations. J.A.B.

CELLULOSE—DEGRADATION

HOCK, CHARLES W. Degradation of cellulose as revealed microscopically. Textile Research J. 20, no. 3: 141-51 (March, 1950).

Because natural cellulose is fundamentally fibrous, degradation (whether it is caused by chemical agents such as acids and alkalies, by physical agents such as grinding and ultrasonic vibration, or by biological agents such as molds and bacteria) proceeds in a manner which reflects this basic fibrillate structure. The dimensions of the thread-like fibrils into which cellulose breaks down vary, depending upon the severity of the treatment and perhaps also on innate differences among celluloses from various sources. Following degradative action, light microscopy reveals fibrils of the order of several tenths of a micron in diameter. At the higher magnifications obtainable with the electron microscope, still finer fibrils, a few hundred Ångströms wide, are detectable. Certain degradative treatments cause a further transverse splitting of these fibrils into rod-shaped structures. From x-ray and chemical investigations it is known that cellulose is made up of long-chain molecules, whose arrangement with respect to one another gives rise to more or less ordered but poorly reactive crystalline regions and to disordered but easily reactive amorphous regions. Since microscopic studies show that many reactions proceed more easily in the regions between the fibrils than within the fibrils themselves, it appears that the crystalline cellulose is located principally in the fibrils, whereas the interfibrillar regions compose, in large measure, the amorphous fraction. 10 figures and 38 references. E.S.

KLEINERT, TH., and MÖSSMER, V. Heterogeneous degradation of cellulose. II. Mild oxidative degradation by means of sodium toluenesulfonyl chloroamide. Monatsh. 81, no. 1-2: 118-21 (February, 1950). [In German] *cf.* B.I.P.C. 19: 384.

The object of this work was to carry out a heterogeneous degradation by oxidation of cellulose under very mild conditions for long periods of time to eliminate diffusion effects as much as possible. Data are given for a rayon pulp of 94.6% α-cellulose content and 785 D.P. (viscometric), treated with very dilute sodium toluenesulfonyl chloroamide ("Chloramin Fahlberg") solution at 20° C. with exclusion of light for 355 days, showing the oxygen consumption and the change in D.P. with time at intervals over this period. When a viscometric average D.P. of approximately 500 is reached, after about 90 days, further change in D.P. is extremely slow. The presence of more easily broken linkages at periodic intervals in the cellulose molecular system is indicated. Calculation of the degree of cleavage with time shows a curve of two practically linear branches, with the transition occurring suddenly in the range of 500 D.P. The same behavior had previously been found with heterogeneous hydrolytic degradation (*cf.* B.I.P.C. 19: 384). Similar experiments on the oxidative degradation of cotton are in progress, and the results will be published shortly. 1 table, 1 figure, and 19 footnotes.
M.A.H.

CELLULOSE—OXYCELLULOSE

REEVES, RICHARD E., and DARBY, FELIX F., JR. Stabilization of periodate-oxidized cotton. Textile Research J. 20, no. 3: 172-4 (March, 1950); *cf.* B.I.P.C. 14: 136.

Earlier observations regarding the stabilization of periodate-oxidized cotton fiber by treatment with chlorous acid or ethereal diazomethane are confirmed and evaluation of the treatments has been extended to a more complex system, cotton sewing thread. At low levels of oxidation the treated samples retain considerably more strength after exposure to sodium carbonate solution than do samples which are oxidized but are not given a stabilization treatment. At high levels of oxidation the stabilizing treatments produce good reductions in alkali-solubility. 1 table, 2 figures, 2 references. E.S.

CELLULOSE—SOLUBILITY

MEYER, KURT H., STUDER, M., and VAN DER WYK, A. J. A. The dissolution of cellulose in organic solvents. Monatsh. 81, no. 1-2: 151-4 (February, 1950). [In German]

This study was undertaken because of the lack of data in the literature on the solubility of cellulose in organic solvents. A patent (German patent 408,821) reporting the solution of cellulose in a mixture of pyridine and chloral was investigated, but not all cellulose preparations could be dissolved. By dissolving a rayon pulp in cuprammonium solution, reprecipitating, purifying with electrodialysis, and replacing the final wash water with pyridine, the product dissolved on the addition of chloral. The original pulp, however, was not soluble. The difference in behavior is ascribed to differences in crystallinity. When the regenerated cellulose was dried, it was no longer soluble in the pyridine-choral mixture. The regeneration and replacement of water with pyridine was applied to a cotton cellulose, but in this case the product could not be dissolved by adding chloral. It is concluded that the greater average molecular weight of the cotton was responsible for the insolubility. A number of other organic solvent mixtures, with quinoline as well as with pyridine, have been used, both on regenerated pulp and cotton, and the solubility behavior is tabulated. It is postulated that the solution mechanism, when it occurs, involves the preliminary formation of an addition compound between cellulose and one of the solvent components (chloral, for example) which then dissolves in the second component (pyridine or quinoline). If the cellulose is precipitated in methanol from pyridine-chloral

solution, the precipitate contains bound chloral but no pyridine. Salts which are solvents for cellulose in concentrated aqueous solutions are much better solvents in pyridine or quinoline. 1 table and 6 references. M.A.H.

CELLULOSE ESTERS

MALM, CARL J., TANGHE, LEO J., and SMITH, GLENN D. Salt effect in cellulose acetate. Ind. Eng. Chem. 42, no. 4: 730-4 (April, 1950).

"Salt effect" is a measure of the increase in viscosity of cellulose acetate caused by the presence of certain salts. A procedure for the measurement of the salt effect has been developed. The influence of salts on viscosity depends on: the nature of the salt, the amount of salt, the pH of the solution from which the salt is applied, the solvent for the cellulose acetate in solution, the degree of hydrolysis of cellulose acetate, and the amounts of carboxyl and combined sulfate in the cellulose acetate. 10 tables, 2 figures, and 11 references. E.S.

SIGNER, R., AEBY, A., OPDERBECK, F., and STUDER, H. Separation of cellulose into molecules and larger particles on esterification. Monatsh. 81, no. 1-2: 232-8 (February, 1950). [In German]

Measurements of the streaming double refraction of a number of organic acid esters of cellulose indicate the presence of larger aggregates in addition to single chain molecules. By fractionation, these particles can be concentrated with the more insoluble portion, as shown by the great differences in the streaming double refraction of the fractions. Corroborative evidence has also been obtained by sedimentation diagrams in the ultracentrifuge, and visibly from electron micrographs. With an isobutyric acid ester it was shown that after a short esterification time the product became enriched in particles larger than single molecules but, on continued treatment with the esterification mixture, they diminished and finally disappeared. This supports the conjecture that the particles are well-crystallized areas which in the beginning are only superficially esterified, but which eventually react completely. 2 tables, 6 figures, and 9 footnotes. M.A.H.

CELLULOSE ESTERS—NITROCELLULOSE

BROOKS, MARVIN C., and BADGER, RICHARD M. Partition systems for the fractionation of nitrocellulose with respect to molecular weight. J. Am. Chem. Soc. 72, no. 4: 1705-9 (April, 1950).

Several two-phase systems in which cellulose triacetate gel is equilibrated with mixtures of methyl acetate and cosolvent have been investigated with respect to the distribution of nitrocellulose between the phases. The distribution constants of nitrocellulose were found to be dependent both on the molecular weight and on the degree of nitration. The distribution constants were found to be independent of nitrocellulose concentration in the range 0—10 mg. of nitrocellulose/g. of cellulose triacetate. The rate of equilibration of nitrocellulose between gel and supernatant phases is apparently limited by diffusion within the gel particles; the rate was increased by reducing the size of the gel particles. A system in which methyl acetate and water are used as cosolvents shows promise for application in a partition-chromatographic fractionation of nitrocellulose. 2 tables, 3 figures, and 9 footnotes. E.S.

CHEMICAL TESTING—BLACK LIQUOR

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of evaporation residue in black liquor.

Svensk Papperstidn. 53, no. 3: 65 (Feb. 15, 1950). [In Swedish, English, and German] *cf.* B.I.P.C. 20: 478.

The text of the Swedish Standard CCA23 is given, covering the method of analysis and the calculation. E.S.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

SCHERER, PHILIP C., and MCNEER, REMBERT D. Mechanical properties of high polymers as functions of the shape of the distribution curve. IV. Ethyl cellulose. Rayon and Synthetic Textiles 31, no. 2: 53-5; no. 4: 54-6 (February, April, 1950); *cf.* B.I.P.C. 20: 309.

A report is given of a further investigation on the relation between mechanical properties of cellulose derivative films and the average degree of polymerization. In the present work, blends were prepared from the ethylcellulose fractions in which the shape of the differential distribution curve was arbitrarily varied, and an attempt was made to correlate the mechanical properties to the shape of such curves. The results were similar to those reported in the previous article: the properties of the films improved with an increase in the average D.P. up to 200, but became unmeasurable when the D.P. dropped below 50. In nearly all of the prepared blends, the percentage of material having a D.P. of less than 100 ran from 17 to 25%, and yet the mechanical properties were better than those of the original material or of fractions containing much less low D.P. material; it is suggested that the low D.P. material exerts a plasticizing effect on the film. The conclusion drawn by the authors is that the mechanical properties of ethylcellulose films depend largely on the D.P. of the maximum point in the differential distribution curve and upon the heterogeneity of distribution of the material among the different D.P.'s present. 5 tables, 27 graphs, and 12 references. J.A.B.

CHEMIGROUNDWOOD PROCESS

LIBBY, C. E., and O'NEIL, F. W. The manufacture of chemigroundwood pulp from hardwoods. Tappi 33, no. 4: 161-78 (April, 1950); Paper Mill News 73, no. 12: 70, 72 (March 25, 1950); Fibre Containers 35, no. 4: 76, 78-9 (April, 1950); Paper Trade J. 130, no. 15: 27, 29-30, 32 (April 13, 1950). [Abridgments]

A process has been developed for converting aspen-, birch-, beech-, and maplewoods into mechanical pulps which may be substituted successfully for spruce mechanical pulp in most grades of paper. It is proposed to identify this new type of wood pulp by the coined name "Chemigroundwood." The chemigroundwood process consists of a mild chemical pretreatment of the wood in block form followed by mechanical defibering in any conventional wood pulp grinder. Chemigroundwood pulp is manufactured more successfully from hardwoods than from softwoods, since the coniferous woods do not respond as favorably to this type of chemical treatment. The treated hardwood is ground with one half to two thirds the power and at double the production rate of spruce groundwood. The pulp itself is three to four times as strong as ordinary spruce groundwood, standing intermediate in this respect between spruce groundwood and unbleached sulfite pulp. The chemigroundwood process gives pulp yields ranging between 85 and 90% of the weight of the original wood. Most species of hardwoods give chemigroundwood pulps which may be bleached with peroxide or calcium hypochlorite to the same final brightness as spruce pulp and at no greater cost. The high density of the principal hardwoods results in pulp yields that exceed the

average yield from the conifers by at least 700 pounds per cord of wood. The value of this additional pulp is several times as great as the cost of the mild chemical pretreatments which are an essential feature of this new pulping process. The Northeastern states have abundant resources of hardwoods that are available at relatively low cost compared with the softwoods. The ample supply of these woods, in addition to the tremendous advantages in quality and yield of fiber by the chemigroundwood process, presents to the paper industry of this region an unprecedented opportunity to re-establish the manufacture of wood pulp from native woods on a sound economic basis. 18 tables, 30 figures, and 17 references. E.S.

COLORIMETRY

DAVIDSON, H. R. Calculation of subtractive color mixtures. J. Optical Soc. Am. 40, no. 4: 230-1 (April, 1950).

A set of simple equations for the calculation of tristimulus values of subtractive color mixtures in solution has been developed for the specialized case in which the ratios of transmittances of the component colorants are constant over all wavelengths in the visible spectrum. The values calculated are shown to represent the maximum values for mixtures of components with ratios of transmittance which differ from the specialized case, and it may also be demonstrated that no points of inflection may exist in the plots of tristimulus values *vs.* concentration of components. In practical mixtures, departures from these theoretically derived relationships are caused by interaction of the components. In use, the equations prove to be sufficiently accurate for the calculation of tristimulus values of most mixtures in which the color gamut is small. 3 figures and 1 reference. E.S.

COST—ACCOUNTING

MOORE, W. CLEMENT. Budgetary control for the average business through the use of a "break-even" chart. Shears 68, no. 688: 20-1 (April, 1950).

A simple form of the profitgraph devised by The Clement Moore Associates, Inc., is illustrated, and its use is explained by means of a specific example. The first step in budgetary control is to determine the compulsory operating expenses which must be covered before a definite profit is assured. Then a profit goal for the year is decided upon, and the amount of dollar sales necessary to achieve this goal is calculated; this figure is broken down by percentages into the various expense groups. The proposed budget may be interpreted in chart form on regular graph paper, with each square representing a given sum. By locating the amount of sales at any given point, one may determine at any time whether the business is in line with the budget. A cost analyst or engineer familiar with the fine distinction between fixed charges, variable costs, and semivariable elements should be consulted in the use of the profitgraph. J.A.B.

ESPARTO

J. C. B. The persistent esparto. Paper Making and Paper Selling 68, no. 4: 47 (Winter, 1949-50).

In spite of many predictions that esparto papers will be superseded by the cheaper wood-pulp papers, their consumption has consistently increased. The present importation of 400,000 tons of grass may be exceptional and may be caused by the immediate shortage of other papermaking materials; adjustments to prewar levels can be expected as soon as wood-pulp imports return to normal conditions. The secret of the success of esparto papers is probably

to be sought in their suitability for fine printing and multicolor work. The grass fiber is an extremely small fiber which is not seriously altered in the process of manufacture. The finished sheet is closely felted and opaque, and possesses good bulk and a fine even surface. The fibers, which are intact, tend to resist compression and present a cushioning base for the printing impression; their dimensional stability is another asset in multicolor work where accurate register is important. The esparto sheet is also an ideal base for coating. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

GENERAL AMERICAN TRANSPORTATION CORPORATION, *Chicago.* Scale removed from evaporator heating surfaces without shutting down process. Chem. Processing 13, no. 4: 94-5 (April, 1950); *cf.* B.I.P.C. 20: 559.

An illustrated description of the Conkey flat plate heating surface evaporator is given, in which the liquid and steam sides are periodically switched, so that any scale deposited from the liquid is dissolved at timed intervals by vapor and condensate. 2 figures. E.S.

FIBER—DIMENSIONS

PEARSON, NORMA L. Perimeter measurements of cotton fibers in the primary-wall stage; a method and its application. Textile Research J. 20, no. 3: 152-64 (March, 1950).

A study was undertaken to investigate the possibility of obtaining comparable perimeter values for different types of cotton by measuring the perimeters of fibers in the primary-wall stage after they have been dried to a glass slide. The procedures followed in collecting material and making the slides and measurements are described. Fibers and place of measurement were selected on the basis of information acquired from a study of perimeter variation with position of the fiber on the seed, the seed in the lock, the age or length of fiber, and along the fiber. Perimeter values were obtained for nine strains of cotton selected to represent a range in perimeters. These values were compared with other measurements of fiber fineness made on the mature fibers of the same cottons. Differences among the types in primary-wall perimeters were similar to differences in perimeter values obtained for the mature fibers. The general consistency in the results warrants the conclusion that reliable information regarding the perimeters of mature fibers of a strain of cotton may be obtained by selecting and measuring the fibers in the primary-wall stage according to the method described in this report. 3 tables, 13 figures, and 11 references. E.S.

FIBER—STRUCTURE

LAUER, K. The study of cellulose fibers. 8. The wet-strength properties of cellulose fibers. Kolloid-Z. 109, no. 3: 144-5 (December, 1944). [In German] *cf.* B.I.P.C. 15: 90-1.

The author replies to P. H. Hermans' critique of his theories on the wet-strength properties of native and regenerated cellulose fibers (*cf.* B.I.P.C. 17: 62). 6 footnotes. E.S.

LAUER, K., BEZNER, O., and DOBBERSTEIN, O. The study of cellulose fibers. 10. Processes in drying cellulose fibers. Kolloid-Z. 116, no. 1: 28-31 (January, 1950). [In German]

From extensive experiments on drying regenerated cellulose (viscose) fibers, it appears that lower swelling values and less dye absorptivity are obtained with increasing drying temperatures. These properties reflect the amount of internal surface and the extent of cross bridging in the amorphous cellulose portion of the fiber. Duration of drying, repeated drying, and steaming of the fibers lead to essentially the same phenomena. The changes in the fiber structure are partially reversible, partially irreversible. It is concluded that during the drying, new lateral bonds are formed in the amorphous regions between adjacent chain molecules, some of which can be broken by boiling in water or 1% caustic solution, whereas others cannot, because at these points the hydroxyl groups have been able to come very close together and form stronger bonds. 5 tables and 8 references. M.A.H.

LAUER, K., BEZNER, O., and DOBBERSTEIN, O. The study of cellulose fibers. 11. The effect of acid catalysts in the drying of cellulose fibers. Kolloid-Z. 116, no. 1: 31-3 (January, 1950). [In German]

In the preceding communication of this series, it was shown that in drying viscose fibers two kinds of cross linkages are formed, one type reversible and the other irreversible on boiling with water or 1% caustic soda. It is considered that both must be secondary valence or hydrogen bonds in the amorphous regions, differing only in the relative distance between the hydroxyl groups of adjacent chains, since the solubility of the material in cuprammonium or alkali solutions is not affected. In the present work it is found that on drying in the presence of acid catalysts a new kind of cross bridging occurs, which results in a decreasing cuprammonium solubility of the fibers. Whether this linkage arises through ether, inner ester, or anhydride formation has not been determined. 3 tables, 3 figures, and 3 footnotes. M.A.H.

LAUER, K., MANSCH, W., and MESKE, B. The study of cellulose fibers. 9. The elastic properties of cellulose fibers. Kolloid-Z. 112, no. 2-3: 110-20 (February-March, 1949); C.A. 43, no. 22: 9435 (Nov. 25, 1949). [In German; abstract in English]

There are no fundamental differences in the behavior of the various commercial staple fibers and rayons under tension in the direction of the long fiber axis. Thus no definite relation between stretching and useful properties can be established. Under comparable conditions, however, the elastic state of the fiber increases with the titer and approaches that of cotton fiber. Some synthetic cellulose fibers show better elastic properties than sheep's wool when wet, but are inferior when dry. Attempts to show a definite relation between flexing behavior and quality of the cellulose fibers were inconclusive. 8 tables, 20 figures, and 13 footnotes. E.S.

FIBER—TESTING

MHATRE, S. H., and PRESTON, J. M. A new apparatus for measuring the density of fibres. J. Textile Inst. 40, no. 12: T831-8 (December, 1949).

An electromagnetic method is described for measuring the densities of fibers, from which their sorption of solutes can be calculated. By the use of an especially designed densitometer, consisting of a float in a tube of liquid, a larger tube through which water was circulated, and a solenoid, the weight of fibers in water was determined. The airdry fibers were packed in a small, conical glass basket which, together with the float, had been previously weighed in air and in water; then the sample was deaerated and placed in

the density tube. By measuring the current required to balance the tube, the density was calculated according to a method which is described. 4 figures and 7 references. J.A.B.

FINANCE

SHALLCROSS, RUTH E. The role of life insurance companies in paper industry financing in the postwar period—1945-1949. Paper Trade J. 130, no. 16: 20-1, 24, 26, 28, 32, 34, 36 (April 20, 1950).

During the postwar period, the paper industry retained from earnings and other internal funds an estimated billion dollars and secured $193.5 million from stock and $555.5 million from debt financing. The 26:74 stock-debt ratio of outside funds obtained is a little higher than for industry generally for the same period. Life insurance companies, according to a study of the investment portfolios of the major life companies, held between 50-60% of the paper industry's postwar debt. Details of important paper industry financing are given by company, type, and years, and the volume of paper industry securities held in the portfolios of the insurance companies is tabulated by life company. 6 tables. R.S.

FLOCCULATION

MASON, S. G. The motion of fibres in flowing liquids. Pulp Paper Mag. Can. 51, no. 5: 93-100 (April, 1950); *cf.* B.I.P.C. 19: 393.

When a suspension of fibers is pumped, stirred, or otherwise caused to flow, the resulting velocity gradients cause the fibers to undergo rotations. These rotations are believed to be of considerable importance in the theory of screening action, flocculation, paper formation, etc. In a one-dimensional shear field Jeffery's theoretical equations predict that smooth, rigid, cylindrical particles undergo periodic rotations in regular orbits. This motion gives rise to a definite pattern of particle orientation with respect to the direction of flow. At the same time the effective volume of the particle is many times greater than its actual volume. Shear motion provides a mechanism whereby the particles can collide with one another. Equations are derived relating the collision frequency to the concentration, fiber size, and shear rate. Estimates of the collision frequencies of fibers in a Fourdrinier machine slice are given. Even under conditions of laminar flow the collision frequencies are surprisingly high, indicating that a large amount of interaction between fibers is brought about by the shearing action of the slice. The critical concentration for independent fiber motion is calculated from the foregoing principles and is shown to be well below the concentrations of stocks conventionally handled in the papermaking process. Above the critical concentration the fibers cannot move independently, and flocculation by "mechanical entanglement" is an inevitable result of motion of the suspension. The use of stocks of consistency in excess of the critical value has a number of important implications in papermaking, several of which are discussed. 5 tables, 8 figures, and 11 references. E.S.

FOAM

PAISLEY PRODUCTS INCORPORATED. New foam control chemical. Can. Pulp Paper Ind. 3, no. 4: 30 (April, 1950); Chem. Processing 13, no. 5: 16-17 (May, 1950).

Reference is made to a new product, Emulsion Foam Killer, a creamy stable emulsion, which can be added to the beaters or immediately before the stock passes through screens, rifflers, or washers, or at any point before it reaches the wire. The foam killer disperses quickly throughout the stock

and breaks up the small foam bubbles before they grow into larger sizes, so that a better sheet formation results. It can also be used in bleach plants, where it is introduced before the screens. 2 figures. E.S.

FOLDING BOXES

ANON. Cookies in foil. Modern Packaging 23, no. 8: 162-3 (April, 1950).

The new type of cooky package introduced by the Southern Biscuit Co., Richmond, Va., is a simple folding carton made of sturdy, white, machine-coated board, with a corrugated parchment liner, and overwrapped with a foil-wax-tissue lamination. It is claimed to give five times the freshness protection of a double-wax-wrapped cooky package, and storage tests indicate that the shelf life is exceptionally long. The package is designed specifically for the company's three new cooky products—lemon thins, orange thins, and chocolate pecan cookies. This is a step toward the company's broad expansion into popular-price markets. 4 figures. J.A.B.

ANON. Cushion cartons. Modern Packaging 23, no. 8: 146-7 (April, 1950).

A new one-piece carton for bottled products is die-cut and scored so that when folded, glued, and set up, it is double-walled, eliminating the need for a separate liner. A cushioning effect is achieved by spacing the inner wall about 1/8 inch inside the outer one and holding it in place by means of a series of flanges die-cut along the score lines. An extra flap on the bottom gives the carton considerably more rigidity and strength. A machine is being developed for setting up and loading the boxes automatically; this will be used by the Wildroot Co. Several cosmetic firms have adopted these cartons for packaging their bottled products. 4 illustrations. J.A.B.

FORESTS AND FORESTRY

BASER, NORT. Neighborly forestry. Am. Forests 56, no. 4: 22-4, 40-1 (April, 1950).

As a means of insuring large and perpetual supplies of wood near at hand, the Woodlands Department of the International Paper Co., Southern Kraft Corp., at Georgetown, S.C., seeks out landowners who need help with their forestry management problems and contacts pulpwood producers to urge them to comply with the cutting practices recommended by the Southern Pulpwood Conservation Association. 3 illustrations. J.A.B.

HOSIE, R. C. Forest regeneration. Pulp Paper Mag. Can. 51, no. 4: 114, 116 (March, 1950).

The author discusses the confusion resulting in forest regeneration surveys from differences in the application of the (now generally-used) stocked-quadrat method by various investigators, which necessitates a conversion to equivalents if valid comparisons are to be made. When the figures are adjusted to a common basis, the previously diverging results were usually found to be almost identical when two different investigators had worked over the same area. The need for trained observers is emphasized, as well as the need for a more concentrated study to determine the factors responsible for the success or failure of reproduction following logging. Suggestions for obtaining permanent results are given. E.S.

WINTERS, ROBERT H. A new basis for Canadian forestry. Pulp Paper Mag. Can. 51, no. 4: 108-10, 112 (March, 1950).

On December 10, 1949, the Canada Forestry Act became law. It provides a statutory foundation for a national forest policy, by which the Federal Government acknowledges its vital concern in the development of Canada's forests and expresses its willingness to accept its share of the cost involved. Although all matters involving forests are the responsibility of the Provincial Governments, the Federal Government can now enter into agreements with the provinces, corporations, or individuals to develop and conserve Canada's forest resources. The act gives the Federal Government the power to establish national forests or experimental stations and areas on lands belonging to the Federal Government and to establish and maintain laboratories for the better utilization of forest products. Adequate forest-fire protection and the provision for economic forestry studies and research are among the objectives of the provisions of the act. E.S.

GROUNDWOOD PULP

BADE, OTTO M., and HOLTE, TORGRIM. Chemical treatment of groundwood pulp for preventing damage by molds. 2. Addition to the system. Norsk Skogind. 4, no. 2: 29-34 (February, 1950). [In Norwegian; English summary] *cf.* B.I.P.C. 19: 87-8.

Further investigations on the treatment of groundwood pulp with chemicals were carried out in three Norwegian groundwood mills. In all three cases, organic phenylmercuric compounds were employed; BSM-11B (an American product) in mills A and B, and Pulpasan F (a Swedish product) and Scutamol (a British product) in mill C. The disinfectants were added to the stuff chests or the white-water system. The details of the application methods at different white-water temperatures (ranging from 45-60° C.) are given. The treated bales were stored partly in the grinder room (immediately covered with a tarpaulin to prevent the drying out of the bales; the tarpaulin was kept moist all the time) and partly in storage sheds, protected from rain and sunshine; they were inspected at intervals of up to 10 months' storage periods. The results are tabulated; the degree of attack was expressed by a scale with numbers ranging from 1-20, in which 20 indicated the optimum results (bale absolutely free from mold attack). The results appear to be quite promising, although it seems difficult to combat the *Penicillium roqueforti* species. The difference between the two storage places is not as pronounced as that resulting from the white-water temperatures; the lower temperatures (45° C.) invariably yield higher scale numbers. The chemical treatment increases the cost of groundwood pulp manufacture; it will be advantageous for the mills working with a high white-water temperature and storing pulp during the warmer seasons of the year. The need for co-operative studies by producers and users in future experiments is indicated. 10 tables. E.S.

KENDALL, L. E. Mechanical pulp. World's Paper Trade Rev. 133, no. 9: Tech. Sup. 30-2 (March 2, 1950); Paper-Maker (London) 119, no. 2: 98, 100-1 (February, 1950).

Bowater's Kemsley mill in England produces mechanical pulp on 36 grinders from wood imported from Canada, Finland, Poland, and other European sources, in addition to domestic supplies. The author discusses the development of groundwood testing, species used in the process, pulpstones and burring, screening, and the use of tailings for board manufacture. E.S.

HOP VINES

SUTCLIFFE, H. M., ERNST, A. J., and ARONOVSKY, S. I. Hop vines for paper. The Hopper 6, no. 10: 4-7 (January, 1950).

The results of preliminary pulping trials with hop vines are reported. An approximate chemical analysis is included (Cross and Bevan cellulose 42.4%, lignin 26.2%, and pentosans 19%). Pulps were produced by the kraft and neutral sodium sulfite process in considerably lower yields than from wheat straw, and their strength characteristics were also inferior. They are unsuitable for the production of high-grade specialty papers or as raw material for corrugating board (because of the low yield). During a shortage of more suitable raw materials, they could probably be used as filler material in corrugating paper or board products. 2 tables and 7 figures. E.S.

INK

FACHKUNDE-KARTEI. Inks. Allg. Papier-Rundschau no. 15: 739 (Nov. 30, 1949). [In German]

Different types of writing and special inks are described; this is chart WS 1 of a series. E.S.

INSTRUMENTATION

CHANDLER, JOHN B. The instrumentation of continuous brown stock washing systems. Southern Pulp Paper Manuf. 13, no. 4: 54, 56, 58 (April, 1950).

Instrument measurement and control represent an important part of modern continuous pulp-washing systems, because any variation of flow or consistency in any section of the continuous system will upset the uniform operation in the succeeding units. Supplemented by a flowsheet, the individually engineered instrumentation of the blow tank following the digesters, the knotter (if one is used), the three washers, the stock storage chest, the three liquor tanks, and the foam tank is discussed. Variations in process equipment will require variations in instrumentation. In modern mills, most of the recording and controlling instruments will be centralized on a conveniently located panel board; this "packaged-unit" instrumentation is essentially the same for all units. 1 flowsheet. E.S.

LACQUER AND LACQUERING

COLLINS, T. T., JR. Solubilities of waxes in alcohols and other solvents. Paper Ind. 32, no. 1: 58-9, 62-3 (April, 1950).

The possibility of moisture-vaporproof lacquer formulations using alcohol as a solvent for different waxes is discussed. The literature on wax solubilities in alcohol and methods of measurement is reviewed briefly; the cloud-temperature procedure was found the most suitable for the determination of the least soluble component of the wax. The results obtained with a number of waxes in different solvents are plotted in four graphs. The author emphasizes that, contrary to the opinion of some investigators, paraffin waxes appear to have sufficient solubility in alcohol to make possible the formulation of moisture-vaporproof lacquers which are based on alcohol as the solvent. 10 references. E.S.

LIGNIN

BELL, ALAN, and WRIGHT, GEORGE F. The extraction of birch lignins with acetic acid. J. Am. Chem. Soc. 72, no. 4: 1495-9 (April, 1950).

Glacial acetic acid has been shown to be a good extraction medium for the removal of lignin from yellow birch. A lignin-carbohydrate compound has been isolated from yellow birch. Most processes of lignin extraction in-

volved a hydrolysis of this complex into isolated lignin and carbohydrate. The carbohydrate material is shown to be partially D-xylose. 3 tables and 14 footnotes. E.S.

WACEK, A., and DÄUBNER-RETTENBACHER, H. The decomposition of sprucewood with phenol and the condensation of phenol with lignin. Monatsh. 81, no. 1-2: 266-73 (February, 1950). [In German]

Phenol spruce lignin, prepared according to Hibbert and co-workers (*cf.* B.I.P.C. 6: 138) was oxidized according to Freudenberg, Lautsch, and Engler (*cf.* B.I.P.C. 10: 313), yielding a small amount of salicylic acid. In the same way *p*-cresol lignin and *p*-chlorophenol lignin give *p*-cresotinic and 5-chlorosalicylic acid. From this it is concluded that at least a part of the phenol condensed with the lignin has undergone a carbon-to-carbon condensation. Decomposition of sprucewood with phenol in the presence of boric anhydride for five hours at 150-160° C. gives a phenol lignin with 10.85% methoxyl. Alkaline hydrolysis of *p*-chlorophenol lignin according to Kratzl and Rettenbacher (*cf.* B.I.P.C. 20: 321) gives acetaldehyde and only a trace of vanillin. Ethanol lignin treated in the same way gives no vanillin. 17 references. F.E.B.

LIGNIN—ABSORPTION SPECTRA

AULIN-ERDTMAN, GUNHILD. The ultraviolet spectrochemistry of lignin. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 2: 51-9 (February, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 701.

Essentially the same information as that in the previous reference is given, although in somewhat extended form. 15 figures and 22 references. E.S.

LIME AND LIMESTONE

GIBBS, RALPH. The development and transfer of heat in rotary kilns. Paper Ind. 32, no. 1: 54-7, 62 (April, 1950); *cf.* B.I.P.C. 20: 322.

The author compares the costs of firing rotary lime kilns with different fuels and discusses heat-transfer rates, including the relation between the production capacity of the kiln and its physical dimensions. Data for wet-feed and dry-feed kilns are given; both cases show that it is desirable to have the largest feasible diameter of such a length that ample time will be allowed to add the required amount of heat to the charge with a minimum of waste in the gases. 6 tables and 5 figures. E.S.

LOADING AND UNLOADING—CARS

ASSOCIATION OF AMERICAN RAILROADS. *Freight Loading and Container Section.* Corrugated in loading method for clay flue lining. Fibre Containers 35, no. 4: 97-8 (April, 1950).

Directions for the preparation of floating loads of clay flue lining are given, including selection of cars, loading and bracing, and doorway protection. Double-faced corrugated fiberboard (not less than 200 pounds Mullen or Cady test) is specified for separating the individual stacks of material. 1 diagram. E.S.

LUBRICATION AND LUBRICANTS

BREWER, A. F. Lubricating the modern paper machine. Pulp

Paper Mag. Can. 51, no. 4: 91-6 (March, 1950); *cf.* B.I.P.C. 19: 850.

This is essentially the same description as that given in the previous reference; no diagrams are included. E.S.

ENKVIST, TERJE, and KAHILA, SEPPO. Lubricating oil from wood tar and tall oil. 6. The catalytic production of lubricating oil from crude tall oil and tall oil pitch. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 1: 26-32 (January, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 19: 553-4.

Laboratory experiments were carried out at the Central Laboratory in Helsingfors during 1942-45 on the preparation of lubricating oils from crude tall oil, using the same apparatus that was employed in the corresponding experiments with wood tar. The results indicated that lubricating oils of comparatively high-viscosity and low-viscosity pole height can be made from crude tall oil in yields of about 60% by heating the oil with 1.5% iron dust or about 3.5% crystallized ferric chloride for one to six hours at 300-320° C., distilling the product with superheated steam at atmospheric pressure, and washing the distillate with caustic soda. The addition of lime subsequent to heating with iron catalysts but prior to distillation yields distillates with low acid contents even after heating for a comparatively short time; however, this procedure presents certain technical difficulties and is not essential. The method which offers the greatest advantages is the separation of the distillate into two main fractions. The lower-boiling fraction has a low freezing point, about −15° C., and its iodine number can readily be reduced from 60 to about 5 by heating with activated fuller's earth. The higher-boiling fraction has a high freezing point, about +5° C. and its iodine number can be somewhat lowered by the use of aluminum chloride. The high freezing point can be somewhat lowered by the addition of genuine Paraflow (a synthetic, high-molecular substance prepared by the condensation of chlorinated paraffin or naphthalene in the presence of aluminum chloride, made by Nobel-Standard) or Finnish substitutes, or by treatment with solvents, followed by cooling and separation by centrifuging or filtering the solid matter, chiefly ketones, such as palmitone, oleone, or stearone. However, the second method involves certain difficulties. The catalytic method can also be applied to the manufacture of lubricating oil from tall oil pitch. 8 tables, 2 figures, and 13 references. E.S.

MACHINERY

ANON. Allis-Chalmers—America's most versatile machinery builder. Paper Trade J. 130, no. 17: 30-4 (April 27, 1950).

Following a brief history of the Allis-Chalmers Manufacturing Co., its present diversified products and services are discussed, which include pulp- and papermaking machinery. Reference is made to the activities of the foundries, machine shops, the hydraulic laboratory, electrical department, and research and testing facilities. Today the company employs around 30,000 workers in its nine plants in different parts of the United States. 12 illustrations. E.S.

GUNDERSEN, FRITS-HARALD. Recent technical developments in the paper industry. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 1: 10-25 (January, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 178-9.

An illustrated review of recent developments in continuous stock prepara-

tion and paper machines is given. The article is similar to the previous reference, although it is more extensive and the arrangement of the material is different. 41 figures. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. German postwar printing and converting machinery. Allg. Papier-Rundschau no. 5: 212-16 (March 15, 1950). [In German]

Different types of offset and sheet-fed rotogravure printing presses and special machines for the manufacture of paper napkins, paper handkerchiefs, and sanitary napkins are described. 7 figures. E.S.

MACHINERY—EMBOSSING MACHINERY

"PRACTICO." How to emboss your cartons. Paper Box Bag Maker: 239-41 (December, 1949); 59-60, 62 (February, 1950).

Descriptions are given of the various types of embossing and the methods for producing them on cartons and folding boxes. A good embossing die should be 0.918 inch high, cast in one piece and milled down to the exact thickness, have walls which are exactly vertical to facilitate firm locking in the machine bed, and should be made of steel. Cold plate embossing can be successfully done on almost any type of cutting and creasing or letterpress printing machine, but the larger and stronger cylinder machines are recommended, particularly if the embossing, cutting, and creasing operations are combined. The procedures for combined make-ready, matrix trimming, and patching are described. J.A.B.

MACHINERY—PACKAGING MACHINERY

LAHEY, R. W. Multiwall bags. Chem. Eng. 57, no. 4: 221-2, 224, 226 (April, 1950); *cf.* B.I.P.C. 20: 590.

The author reviews different types of machinery for the automatic and hand-operated packing of chemicals in multiwall paper shipping bags, such as valve bag packers, screw packers, weighing and sewing equipment, oscillating packers, ram-type packers, etc. Because bag-filling conditions vary greatly, each packaging problem must be studied individually, and the many variations in production and product characteristics must be taken into account. 1 table and 4 illustrations. E.S.

MACHINERY—PRESSES

SMITH, LEON E. Downingtown direct roll loading, recording and controlling. Paper Mill News 73, no. 16: 36, 102, 107, 122 (April 22, 1950); *cf.* B.I.P.C. 20: 250.

The first part of the article is identical with the previous reference. Additional information on the operation of the load cell and on its applications to press rolls, heavy duty presses, calender rolls, and beaters is given. E.S.

MACHINERY—PRINTING MACHINE

ANON. Dual process rotary printing press. Printing Equip. Engr. 79, no. 6: 40 (March, 1950); *cf.* B.I.P.C. 20: 571.

A similar description of the press is given as in the previous reference. The machine is arranged in units, each unit being a complete press in itself; this arrangement will produce as many colors as there are printing-press units. The press may be used to print wrappers, labels, insurance policies, packaging products, and similar items. 1 illustration. E.S.

BLAKEMORE, FRED T. Machine for printed pressure sensitive tape. Am. Paper Converter 24, no. 4: 26 (April, 1950).

The Pamarco Auto Printer, manufactured by the Paper Machinery and Research Co., Inc., Roselle, N.J., prints two colors, using aniline ink and rubber plates, on all types of cellulose, acetate, paper, or cloth up to six inches wide, at speeds of 100 to 200 ft./min. It is not necessary to stop the machine to change rolls and rethread, and register is easily maintained by a simple fingertip control. 1 illustration. J.A.B.

NEW ERA MANUFACTURING COMPANY, *Paterson, N.J.* Am. Paper Converter 24, no. 4: 22-3, 39 (April, 1950).

The progress in the development of multiprocess presses for commercial and specialty printing during the past 50 years is traced through the history of the company. 2 illustrations. J.A.B.

MACHINERY—REFINERS

RUBY [A.] and others. Discussion on stock preparation. Bull. assoc. tech. ind. papetière 4, no. 1: 1-13 (March, 1950). [In French]

The text of a symposium is given verbatim, in which the experiences of members of the association with different types of high-speed refiners and jordans are discussed. 2 diagrams. L.E.W.

TEXTOR, C. K., and EBERHARDT, L. E. Revolving disk mills in straw pulp production. Tappi 33, no. 4: 193-4 (April, 1950).

Laboratory data are given on the processing of straw with disk mills. Confirmation by commercial experience is indicated, but supporting evidence is not given. Laboratory-size units give only a rough correlation between trial and commercial results, but it is believed that the experimental use of full-scale equipment will provide an adequate basis for guaranteeing performance. E.S.

MACHINERY—SAVE-ALLS

NESBITT, W. P. Waco filter as a saveall and freshwater filter. Pulp Paper Mag. Can. 51, no. 4: 82-5 (March, 1950).

The author describes the construction of the Waco filter and gives a brief outline of the method and theory of operation. Results are given of a test installation on a machine making book and writing grades with loading from 0 to 20%. An experimental run using the machine as a fresh water filter on St. Lawrence River water is described and the results are tabulated. 2 tables and 6 figures. E.S.

MACHINERY—SCREENS

ANON. The Lindblad vibrating screen, built by Sund-Skönvik. Svensk Papperstidn. 53, no. 4: 93-4 (Feb. 28, 1950). [In Swedish; English and German summaries]

The general design, operating principles, and efficiency of the Lindblad vibrating screen are described. A screen, 0.75 meter long and one meter in diameter, with slots 0.25 mm. wide, has a daily output of 39 metric tons of airdry bleached sulfite pulp at 1.6% consistency. The production rate for unbleached sulfite is 10%, and for unbleached sulfate, about 20% lower than that for bleached sulfite. The power consumption amounts to 14-15 h.p. 3 figures. E.S.

MACHINERY—SHAKING MECHANISM

LORD, H. The Fourdrinier shake. World's Paper Trade Rev. 133, no. 11: 705-8 (March 16, 1950).

Most mills have experienced troubles with shake connections or roller bearings caused by excessive end-thrust loads or inadequate strength of the parts taking the thrust loads. In addition to the shake, the slice can have a considerable effect on sheet formation, particularly with regard to the relative velocities of the wire and the spouting velocity at the slice. The use of an excessive shake for correcting inadequate spouting velocity at the slice to obtain the desired sheet formation should be avoided, because this practice represents an abuse of the shake. Formulas are given for assessing the loads to be expected on any Fourdrinier wire under varying shake conditions. 1 table and 4 diagrams. E.S.

MACHINERY—SLITTERS AND WINDERS

CHATWIN, M. A. Stroboscope aids winder operation. Paper Ind. 32, no. 1: 53 (April, 1950).

Reference is made to a stroboscopic device for controlling the speed relationship between the winder drums driven by Vari-pitch V-belts. The device was developed for breaking in the winder of the new Powell River newsprint machine (*cf.* B.I.P.C. 19: 482) before the machine started to operate, and is still in use. 4 figures. E.S.

MACHINERY—VALVES

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. *Brown Instrument Division.* Transfer valves solve stock handling problem. Instrumentation 4, no. 4: 23-4 (January-March, 1950).

The Honeywell stock-transfer valve for handling paper stock at low consistencies and its advantages are described; it is available as a straight-through type and a three-way model in sizes from 1½ to 30 inches for manual and remote operation. 3 figures. E.S.

MATERIALS HANDLING

ENGINEERING PRODUCTS COMPANY, *Chicago.* Turntable for turning rolls in cars. Fibre Containers 35, no. 4: 96-7 (April, 1950); Shears 68, no. 688: 42 (April, 1950); Paper Mill News 73, no. 16: 104 (April 22, 1950).

Reference is made to a portable ball-bearing unit, designated as T-127, for turning heavy corrugated board rolls inside the freight cars prior to unloading. The turntable weighs only 28 pounds and can be handled by one worker; power trucks do not have to enter the cars, but can lift the turned rolls from the car floors. 4 illustrations. E.S.

MICROSCOPY (ELECTRON)

HERMANS, P. H. Examination of rayon cross sections with the electron microscope in conjunction with supplementary light-microscopic observations. Textile Research J. 20, no. 2: 105-8 (February, 1950); *cf.* B.I.P.C. 17: 622-3; 19: 486.

The previous attempts to investigate sections of synthetic fibers with the electron microscope have not been very successful, because considerable mechanical damage was done to the material in the cutting operation. The

present author reports reasonable results with paraffin-embedded viscose fibers, using an ordinary Leitz sledge microtome set to cut sections 1μ thick; a few sections were obtained which appeared to be thinner than 1μ and suitable for examination in the 90 KV electron microscope. Several different techniques of microscopic examination, as well as examination in polarized light, were used in the study of the inner structure of these rayon fibers. 1 electron micrograph, 8 photomicrographs and 4 references. J.A.B.

MILL CONTROL

ARNESON, LAWRENCE E. A practical production control method for planning and scheduling orders through a folding box factory. Am. Boxmaker 39, no. 4: 22-7, 46 (April, 1950).

The author advocates a production control department for the folding box factory and explains how one may be set up and operated. Its purpose is to relieve superintendents and foremen of the details of laying out the schedule of work for their respective departments. The first step in production control is to plan the quantities to be run, the procedure to be used, and the department which is to handle an order. Next, the actual scheduling begins, and for this a visible control board is described and illustrated. This board lists each machine and each day of the month, so that an accurate record may be kept of the progress of each order. The importance of reporting and posting production progress regularly is emphasized, for by this method a company can determine whether it is making or losing money on an order. The equipment and printed forms needed by a production control department are listed and illustrated; the suggested procedure to be followed is described in detail. 8 figures. J.A.B.

MOLDED PULP ARTICLES

HEIM, FRIEDRICH. The seamless loud-speaker membrane: a molded pulp product. Allg. Papier-Rundschau no. 2: 44-5 (Jan. 30, 1950). [In German]

The different steps in the manufacture of molded-pulp loud-speaker cones and the necessary machinery are outlined briefly; the correct selection of the furnish and the appropriate beating degree are of great importance. Nearly all available pulps (sulfite, sulfate, rags, straw, groundwood, and imported fibers) have been employed for this purpose; the best results to date have been obtained with esparto pulp. The present products are not yet perfect; co-operation between papermaker and radio engineer is required for further improvements. 2 diagrams. E.S.

NEWSPRINT

MURDOCK, HAROLD R. Newsprint production in occupied Japan. Southern Pulp Paper Manuf. 13, no. 4: 22 (April, 1950); Newsprint Service Bur. Bull. no. 387: 2 (April, 1950).

The most serious and continuing difficulty in the Japanese newsprint industry is the shortage of pulpwood. Production in 1949 amounted to 119,794 short tons, which is far below the economic demand. Until Japan restores its commercial forests, importation of newsprint paper is the only practical possibility for answering the cultural and economic needs for newsprint. 1 table. E.S.

PACKAGING

FOOD INDUSTRIES. Packaging progress. Food Inds. 22, no. 4: 626-37 (April, 1950).

Among the significant postwar trends in the packaging of foods are: the constant introduction of new packaging materials featuring better protection of the product, more sales appeal, and new conveniences for both the food processor and the consumer; the steady development of higher speed, labor-saving machines handling a wide variety of materials of different sizes; and continued redesign of old packages to make them simpler and more attractive, and to stimulate the volume of impulse buying. Plastic and transparent flexible materials are commanding the most attention as packaging materials, and techniques for heat sealing these packages are currently the subject of much investigation. Improved waxed papers, wet-strength papers, resin coatings, and aluminum are also finding many varied uses in packaging. Some of the new packaging machines described are a rotary 16-spindle vacuum-capping machine, 20-, 21-, and 24-pocket filling machines which can fill up to 575 cans per minute, automatic weighing and filling machines, new equipment for the application of thermoplastic labels, and many other auxiliary machines. New package designs for a variety of products are illustrated. 32 illustrations. J.A.B.

PAPER—COATED

HATFIELD, A. L. Vinyl latex coatings. Modern Packaging 23, no. 8: 192-4 (April, 1950).

Two of the vinyl copolymer latices which have found applications in the paper field as moisture-, grease-, and chemical-resistant coatings are Geon Latex 653 and Geon Latex 552. Both are plasticizer-free and therefore may be used in direct contact with foods without danger of plasticizer extraction. Geon Latex 653 is a water dispersion of a specially modified vinyl copolymer which has a total solids content of approximately 50%, whereas Geon Latex 552 is a mixture of a vinyl copolymer with Hycar nitrile-type rubber. Both exhibit excellent grease resistance, but 552 has a much higher water-vapor transmission than 653. Their comparative physical characteristics are given in tabular form. Their adaptability to conventional coating equipment and techniques makes them convenient to use, and their list of applications is steadily increasing. Both latices will dry and form films at room temperatures, but fusion at elevated temperatures greatly improves their physical properties. Prime coating has been found to be the most effective method of producing low-cost, Geon latex-coated paper. Instructions are given for coating with these latices. 4 tables, 1 graph, and 2 illustrations. J.A.B.

KING, CHARLES J. More about absorptivity of paper. Inland Printer 125, no. 1: 43-5 (April, 1950); *cf.* B.I.P.C. 20: 515.

A further discussion of the relationship between ink, fountain water, and coated paper is presented, according to which an oil-absorptive coated paper surface which resists wetting by water will result in the best ink transfer on an offset press. E.S.

WILLETS, WILLIAM R. The rheology of paper coatings. Tappi 33, no. 4: 201-8 (April, 1950).

The importance of the rheological characteristics of coating colors, especially in view of the modern high-speed printing techniques of application, is discussed. The complexity of coating color systems is described. Although no presently available viscometer truly simulates the high shearing effects experienced in practice, tests should be made with a multipoint viscometer so as to give some indication of thixotropic or dilatant characteristics, as well as of apparent viscosity. Certain factors affecting the rheological properties of coating colors were investigated using such a technique. It was found that a relationship between the rheological properties of the slip and

the final coating color did not necessarily exist. A very slight difference in the total solids content of coating colors resulted not only in marked changes in apparent viscosity but also in thixotropic characteristics, but the changes resulting from dilution varied with different colors. Coating colors behaved differently on storage, some becoming less viscous and some developing more body; the effect evidently depends on such factors as composition, dispersants, pH, and total solids. The use of dispersing agents was very critical and it was apparent that an excess would result in increased viscosity, as would the use of too little. The optimum amount to be used varied with different compositions. Dispersants were found to affect the storage stability as well as the rheological characteristics of the colors as made. Although no general rule applicable to all types of coating colors could be derived from this work, the principles and techniques involved could be applied to a specific color to be used in a definite application process. 11 figures and 7 references. E.S.

WILSON, W. C. Reviewing the newer types of paper coatings. Am. Paper Converter 24, no. 4: 20-1, 30 (April, 1950); Am. Boxmaker 39, no. 4: 32-6 (April, 1950).

Papers are coated to improve their appearance or scuff resistance; to render them grease, moisture, or moisture-vapor resistant; or to secure heat sealing, to name a few of the various reasons. Recent developments in the field and their principal applications are reviewed, including heat-glazed finishes, organisols and plastisols (chiefly for fabric coating in the manufacture of artificial leather), and emulsions or latices (natural and synthetic rubbers, saran, etc.). Among the functions that coatings are called upon to perform, one of the rapidly expanding ones is that of heat sealing. The heat-sealing coatings may be divided into two principal groups: melts and solution coatings. In another process which is somewhat intermediate between coating and laminating, the coatings are applied by calendering. Among the plastics employed for this purpose, polyethylene is probably the most extensively used. In conclusion, brief reference is made to certain laminations and to buckling, which is caused by the unequal expansion or contraction of the two laminating materials with changes of moisture content or temperature. J.A.B.

PAPER—COATED (HOT-MELT)

BURGESS, L. M., and SWEC, L. F. Polyethylene-coated paper. Modern Packaging 23, no. 8: 187-91, 258, 260 (April, 1950).

Techniques for laminating polyethylene film to paper were developed some time ago, but not until recently has the resin been applied as a hot-melt coating directly to paper or board. In the method used by the H. P. Smith Paper Co., Chicago, a resin of 18,000 to 19,000 molecular weight or lower and a viscosity of 10,000 to 15,000 poises is applied to paper at temperatures of 400 to 450° F. Relatively high coating speeds are obtained, and the coating thickness is easily controlled with successful results in the range of ½ to 10 mils. Papers or cloth coated by this method are known as "Loxol." Some of the characteristics and test methods are given, and the uses of polyethylene in shipping containers, closure liners, release coatings, and consumer packages are discussed. Prices are established on an area rather than a weight basis and depend upon specifications. The fact that polyethylene is insoluble in and virtually unaffected by almost every liquid, and is incompatible with almost every solid at ordinary temperatures indicates that its packaging potentialities are practically unlimited. 2 tables, 1 graph, 8 illustrations, and 4 references. J.A.B.

PAPER—FILLERS

ANON. Fillers in paper. Allg. Papier-Rundschau no. 15: 731 (Nov. 30, 1949). [In German] *cf.* B.I.P.C. 20: 331.

With reference to the different depth of penetration of inks printed on the wire and felt sides of loaded papers, the following experiments are described. Ashing of a loaded paper sample (basis weight 118 g./sq. m.) yielded an average filler content of 23.6%. To obtain data on the distribution of the filler throughout the sheet, the wire and felt sides were uniformly scraped with a razor blade and the quantity of filler thus obtained from each side was weighed and ashed. The mean of three measurements each yielded 26.7% for the felt and 6.5% for the wire side. The furnish of this paper consisted principally of spruce sulfite pulp with approximately 20-30% deciduous wood pulp and 15-20% straw pulp. The rate of penetration of this paper was tested with the Agahd tester (manufacturer Karl Frank, Weinheim-Birkenau), an electrical instrument designed to measure the wettability of fibrous surfaces and their interiors, in which the penetrating liquid acts as the electrolyte. The rate of penetration from contact of the lower side of the test specimen (placed under slight pressure between two wire electrodes) to penetration to the upper side is indicated by a voltmeter and measured either by recording instruments or a stop watch. Thus far the instrument has been used for testing the suitability of dissolving pulps for rayon manufacture, genuine vegetable parchment, the filtration and absorption behavior of filter and blotting papers, and for the control of impregnated materials, such as artificial leather. Both sides of the paper were tested for their wettability with three liquids (electrolytes) of different viscosity, corresponding to the range of printing inks. The results show that the difference in the rate of penetration between wire and felt sides increases with increasing viscosity of the electrolyte, a confirmation of the behavior of printing inks. 1 table and 1 diagram. E.S.

PAPER AND PULP INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION. Survey of new capacity—1949, 1950, 1951. Paper Mill News 73, no. 16: 78 (April 22, 1950); *cf.* B.I.P.C. 19: 642.

Capacity increases (new and rebuilt machines) are tabulated for the principal grades of paper and board; they are sizable only for wrapping and specialties and for board. The total capacity at the end of 1949 amounted to 23,929,950 tons, an increase of 540,950 tons over 1948; the estimated capacities at the end of 1950 and 1951 are 24,254,055 and 24,311,405 tons, respectively. Since installations may not occur when they are scheduled, a yearly revision of the data is inevitable. 6 tables. E.S.

ANON. Chronological review. Paper Mill News 73, no. 16: 63-4, 66, 68, 70, 72, 74, 106, 108 (April 22, 1950); *cf.* B.I.P.C. 19: 642.

Important events in the pulp and paper industry from April, 1949 to April, 1950 are recorded. E.S.

ANON. Export statistics, 1949. Norsk Skogind. 4, no. 2: 45-7 (February, 1950). [In Norwegian]

Official export statistics for forest products (wood, groundwood and chemical pulps, paper, and board) for Norway, Sweden, and Finland are given in tabular form. E.S.

ARIES, ROBERT S. Cuban pulp and paper industry. Paper Ind. 32, no. 1: 63 (April, 1950).

A brief review of the domestic pulp, paper, and converting industries in Cuba and imports, chiefly from the United States, is given. The country has

interesting prospects because of expanding markets and the availability of bagasse as a cellulosic raw material; with progress in the pulping of bagasse, Cuba may even become a pulp and paper-products exporting nation. E.S.

LAUROLA, OLAVI. Some observations from the pulp and paper industries in the southern states of the United States. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 3: 74-83 (March, 1950). [In Finnish; English abstract]

The author visited a number of southern kraft pulp and paper mills in the United States and discusses forestry and mill practices and mill installations of particular interest. In conclusion, reference is made to the increasing use of the neutral sodium sulfite semichemical process for the manufacture of corrugating board. 4 illustrations. E.S.

NEUBRECH, W. LEROY. Pulp, paper, and paperboard in the United States; review for 1949. Tappi 33, no. 4: 14A, 16A, 18A, 20A, 22A, 24A, 26A, 28A, 30A, 32A, 34A (April, 1950); Paper Mill News 73, no. 16: 40, 42, 44-6, 48, 50, 52, 54, 56, 58 (April 22, 1950).

The text of the annual review (February, 1950 issue) of the Pulp, Paper and Board Industry Report of the Office of Domestic Commerce is reproduced, with graphs omitted in the *Tappi* reference. The reprinted material in *Paper Mill News* includes tables and graphs, with additional information taken from the Facts for Industry series of the Bureau of the Census. E.S.

PERRY, HENRY J. The importance of the paper industry to New York State. Paper Trade J. 130, no. 16: 14, 16, 18 (April 20, 1950); Tappi 33, no. 5: 74A, 76A, 78A; discussion: 78A (May, 1950).

The author discusses the gradual decline in the number of pulp and paper mills in New York State since 1920; its 136 paper mills decreased to 115, and its 61 pulp mills to 44 in 1947. During the 22 years from 1927 to 1949, New York State's contribution to the total supply dropped from 14 to 8% in paper, and from 17 to 5% in pulp, while others satisfied the demand. Some of the closed mills moved south and some have gone out of business permanently. The state held its own by grade shifting, but did not participate in the general business expansion (estimated to be 200% in other industries) of recent years. No newsprint, no kraft liner, and little corrugating are made; the state produces only 70% of its local market on a dollar basis and only 17% of its new fibrous requirements. The reasons for these declines or static conditions are high taxes, compensation insurance, lack of a progressive forestry policy and raw materials, and water-supply and stream-improvement problems. The future of the industry in New York is entirely a political issue; since corporations cannot vote, it is up to the people affected to control the situation. Statistical data in support of the statements are included. 2 tables and 5 graphs. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. Lowell Textile offers 4-year course. Paper Trade J. 130, no. 14: 16-17 (April 6, 1950).

The curriculum is described for the contemplated four-year course which is scheduled to begin at Lowell Textile Institute, Lowell, Mass., early in 1951 and which will lead to a B.S. in paper engineering. The object of this course is to fit a man for work in the papermaking, paper-converting,

or allied industries. An intensive summer course "Paper—its properties and uses" is scheduled for June 5-16, 1950, which is sponsored by the Boston Paper Trade Association and which will consist of lectures, group discussions, and plant visits. E.S.

ANON. Pulp and paper research at Syracuse. Paper Trade J. 130, no. 15: 19-21, 24, 26-7 (April 13, 1950).

Following a brief history of the New York State College of Forestry at Syracuse, N.Y., the Department of Pulp & Paper Manufacture, one of the several units at the college, and its woodroom, pulping (cooking and semi-chemical and groundwood pulp), papermaking, and testing facilities are described. A recent addition to the curriculum is a course in plastics engineering. 7 illustrations. E.S.

GRANT, JULIUS. The value and limitations of the written word in paper making education. World's Paper Trade Rev. 133, no. 9: 564, 566, 568, 588 (March 2, 1950).

The author discusses the relative merits and disadvantages of the three principal methods of education used in the paper industry, i.e., lectures, books, and mill visits. These methods are complementary and should not be considered substitutes for one another; the Education Committee of the (British) Technical Section in its long-range program is attempting to compile a series of papermaking lectures and to make available a library of illustrations, lantern slides, and motion pictures. Of a series of text books, the introductory volume "Paper making," has already been issued; further volumes are in preparation. In conclusion, brief reference is made to the value of examinations as an educational influence rather than as a criterion of real ability; the act of preparing for and writing the examination paper is considered to be of much greater importance than the success achieved in terms of mere marks or percentages. The syllabus for papermaking of the City and Guilds Institute is mentioned; it is at present under revision and an advisory committee representing the paper industry is assisting in this work. E.S.

STRANGE, JOHN G. Education and the paper industry. Tappi 33, no. 4: 82-7A (April, 1950).

The author discusses in some detail the serious problems of public education policies and the educational problems which the pulp and paper industry must meet. In conclusion, reference is made to the educational activities of The Institute of Paper Chemistry and to some of the problems involved in operating an educational institution of this type. The most difficult of these problems is that of selecting the student body, not only in terms of their ability to profit by the educational program, but also in terms of their subsequent ability to survive and grow within the industry after graduation. The methods employed in student selection are discussed briefly. E.S.

PAPER AND PULP MILLS

ANON. New Glory mill opened. World's Paper Trade Rev. 133, no. 7: 468, 470 (Feb. 16, 1950); Paper-Maker (London) 119, no. 3: 171-4, 193 (March, 1950).

Reference is made to the opening on February 10, 1950, by Wiggins, Teape & Co., of a second mill erected alongside the existing building at Wooburn Green, Bucks., England, which will double the output of photographic base paper by the Glory Paper Mills. Construction of the new unit

started in 1947, and many obstacles had to be overcome. The new mill is built in the form of a "U" around the existing air drier; it has been designed to meet the most exacting demands of cleanliness and to exclude dirt and dust from outside and inside. Noncorrosive metals and stainless steel have been employed extensively and the roofs of the machine house and air-drier rooms are in vitreous-enameled steel sheeting which can be heated to avoid condensation. The new machine made by Bertrams Limited has a wire width of 105 inches (95 inches of paper), is about 300 feet long, and has a maximum speed of about 300 feet per minute. Details of the inauguration are mentioned. 4 illustrations in the second reference. E.S.

SOUTHERN PULP AND PAPER MANUFACTURER. The development and the operation of the new pulp and paper mills of the Coosa River Newsprint Company, Coosa Pines, Alabama. Southern Pulp Paper Manuf. 13, no. 4: 30-40, 42, 44, 46, 48, 50-2 (April, 1950); *cf.* B.I.P.C. 20: 505-6.

A profusely illustrated description of the new newsprint mill and its installations is given. E.S.

PAPER SIZING

DELCROIX [P.] Discussion on sizing of machine-glazed papers. Bull. assoc. tech. ind. papetière 4, no. 1: 15-18 (March, 1950). [In French]

The text of a discussion on the subject is given. L.E.W.

PAPER SPECIALTIES

BALSTER. Grain in gummed labels. Allg. Papier-Rundschau no. 4: 166-7 (Feb. 28, 1950). [In German]

With particular reference to labels for bottled goods, the grain of the label paper should run parallel with the print or perpendicular to the axis of the bottle to prevent the edges of the labels from loosening and starting to curl. This has become essential because automatic labeling machines are employed, where the label must be applied in a fraction of a second. During manual operation, it was possible to press unwieldy labels to their support for a correspondingly longer period, so that troubles from faulty paper grain were not frequent. In the conversion of labels for machine application, a medium-weight, soft, flexible, and porous paper is most suitable; lighter weights are recommended for small medicine bottles and ampoules. The edges must be clean cut and all labels must be of a uniform size; supplies should never be stored near a heating source to prevent their drying out. In the case of lacquered labels, a thin coat should be applied and for wrap-around labels, the section to be covered by the overlapping portion should not receive any lacquer to insure firm adhesion. 2 figures. E.S.

DANA, HOMER J., and VAN METER, JAMES L. Pin-pointing ultrasonic energy. Electronics 23, no. 4: 84-5 (April, 1950).

Reference is made to an ultrasonic technique, by which two watts of ultrasonic energy concentrated on a sound-sensitive paper produce a permanent record without touching its surface. The paper is chemically treated so that the portions exposed to the energy undergo a visible change as the recording paper is moved continuously under the generator-recorder point. Details of the ultrasonic generator and its operation are given. 2 illustrations. E.S.

DAVIES, C. N. Paper for air filtration. Paper-Maker (London) 119, no. 4: 258, 260-2 (April, 1950).

There are two main types of fibrous filters; in one, the material is employed as a loose pad of appreciable thickness and in the other, it is made into paper. Paper has a higher air resistance per unit area; by folding and pleating, paper can be obtained in such a compact manner that its inherently high resistance is more than offset by the large surface area, when the overall size of the filter and its efficiency are held constant. The paper filters possess the advantage that the dust load is spread over a large surface, so that clogging is quite slow, provided the air flow is evenly distributed over the entire surface; coarse particles can readily be blown off and the lifetime of the filter increased by a periodical cleansing with compressed air. The diameter of the fibers from which filter papers are made should be small to enhance filtration efficiency. The length of the fiber does not matter; however, a good dispersion of the fibers and freedom from clumps are important. The performance of filters will be improved if the fibers are shredded by mechanical treatment. Filters made from wood-pulp fibers are not capable of stopping particles below 1μ. When this is essential, finer fibers, such as fine asbestos or rock-wool fibers, are added as fillers. Another method which has not yet been applied to paper is the addition of a certain percentage of a natural or synthetic resin of high electrical insulating properties, whereby action is based on an almost permanent electric charge. The need for exhaustive experiments in the design of filters is emphasized; testing should include not only the measurement of the load, but also edge leakage and redispersion of dust after it has been deposited. 4 figures and 4 references. E.S.

DAY, FREDERICK T. Poster stamps as an aid to sales. Brit. Packer 12, no. 3: 31-2 (March, 1950).

One of the popular incentives to increased sales is the poster stamp, or perforated trading stamp, which is an educational and appealing item inserted in product packages to stimulate interest in the product, the sources of supplies of the necessary raw materials, the process of manufacture, etc. They are also used in fund-raising campaigns, the announcement of exhibitions and fairs, for political propaganda, and to encourage traveling. Poster stamps should be attractively designed, printed, perforated, and produced in a standard size. 6 illustrations. J.A.B.

DRISSLER, HANS. Kamí wa kámi; paper, a present of the gods. Allg. Papier-Rundschau no. 3: 98-102 (Feb. 15, 1950). [In German]

An illustrated description of papermaking by hand from the fibers of the paper mulberry (kozo), gampi, and mitsumata in Japan is given, with reference to the difference between the Japanese raw materials, paper molds, and procedures, and those of the old European papermakers. In contrast to the comparatively few European mills which tried to keep their art a secret, Japanese papermaking was widespread and supplemented the scanty income of many peasant families. In addition, paper in Japan was not only used as a writing material as it was for many centuries in Europe, but since early times it has had many functional and decorative applications. 11 illustrations. E.S.

[FACHKUNDE-KARTEI] Vat paper. Allg. Papier-Rundschau no. 4: 175 (Feb. 28, 1950). [In German]

The difference between handmade, cylinder machine-made, and imitation vat paper (produced on the Fourdrinier machine) is explained, as well as

the differentiation between hand- and machine-made papers and between a genuine and artificial vat edge. This is chart WP 1 of a series. E.S.

LITTLE, ARTHUR D., INC., *Cambridge, Mass.* Atomic energy air filter. Paper Trade J. 130, no. 16: 55 (April 20, 1950); Ind. Bull. A. D. Little no. 256: 1 (May, 1950); Chem. Eng. Progress 46, no. 5: 12 [News Section] (May, 1950).

A new filter material has been developed which consists of treated paper-making fibers in combination with very finely divided mineral asbestos fibers. The material can be made on relatively slow Fourdrinier machines; the resulting soft, flexible sheets are then pleated and fitted into wooden frames with plastic adhesives. Gaskets of soft sponge rubber cemented around the edges of the frames prevent air leaks. The material was originally designed for filtering fine radioactive particles from contaminated gaseous wastes and may find general commercial application for filtering industrial stack gases. E.S.

MODERN PACKAGING. Kleenex. Modern Packaging 23, no. 8: 136-41 (April, 1950).

Quality of product, functional packaging, and consistent, imaginative advertising have combined to make Kleenex a household word. Since its introduction by International Cellucotton Products in 1924, when it was the only product of its kind, it has remained the unchallenged leader in what is now a highly competitive field. Its success can be attributed partly to packaging, for not only does its distinctive package design have striking recognition value, but its ingenious Serv-a-Tissue box is an exclusive feature. Kleenex is marketed in 200- and 300-tissue boxes, and in the new Pocket-Pack, which holds 24 tissues; a steady reduction in price has been made possible by increasing production. Two new products are Kleenex Eyeglass Tissues, made of silicone-treated paper, and Kleenex table napkins, soon to be marketed. 1 graph and 8 illustrations. J.A.B.

RAYNER, A. E. Paper in photolitho offset. Indian Print & Paper 15, no. 62: 46-7, 45 (January, 1950).

One of the reasons why the offset litho process has developed rapidly in recent years is the possibility of using a wider variety of paper than in some other printing processes. Suitable offset papers present a solid, well-compacted, evensided sheet, free from fluff, and with a minimum tendency for expansion, waving, or curling. The surface should be a matt eggshell and the color, if white, should be a bright neutral shade, capable of giving the fullest value to the colors of the printing inks. In Great Britain the furnish consists of rag, esparto, or chemical wood pulp. Rag pulp is confined to the most expensive grades; esparto is usually mixed with about 25% chemical wood pulp and yields a well-bulking sheet with a pleasing and receptive printing surface. Some offset papers are made entirely of chemical wood pulp; these are less opaque than esparto papers and are more reactive to atmospheric conditions. The author discusses the various troubles resulting in offset lithography from shortcomings of the paper, such as picking; fluffing; incorrect moisture content, grain direction, or storage conditions; static electricity; drying and pH of coated papers; chalking or powdering; offsetting; and the assembly of sheets from different rolls in the same pile. The reasons for their occurrence and means for their avoidance or maximum limitation are described. E.S.

SCHULZE-HOETZSCH, BRUNO. The concept of fine paper over the course of time. Allg. Papier-Rundschau no. 3: 97-8 (Feb. 15, 1950). [In German]

The author discusses the gradual change of fine papers from a product made exclusively from high-grade rags to wood-pulp and straw-pulp papers, of which only the outstanding grades still include a certain percentage of rag pulp in their furnish. The introduction of the typewriter created the demand for a new kind of fine paper. The German fine paper industry was the first one to recover after the war and is now able to meet the domestic demand. E.S.

SUTHERLAND PAPER COMPANY. Holiday items are year-round sales. Am. Paper Converter 47, no. 4: 30, 40 (April, 1950); *cf.* B.I.P.C. 20: 336.

Complete sets of matching paper products, including cups, six- and eight-inch plates, luncheon and cocktail napkins, party pack sets, and table covers, are now available for seven different holiday seasons: New Year's, Valentine's Day, St. Patrick's Day, Easter, Halloween, Thanksgiving, and Christmas. The company has established a plan by which the Serviset line may be ordered sufficiently in advance of the actual season to allow adequate time for proper selling, yet the merchant does not have to pay for the order until after it is sold. 1 illustration. J.A.B.

TAYLOR INSTRUMENT COMPANIES. Automatic controls insure customer satisfaction for carbon paper manufacturer. Taylor Technol. 2, no. 4: 20-1 (Spring, 1950).

An illustrated description is given of the automatic temperature control for a coating machine used to process carbon and hectograph paper. The composition carbon ink consists of wax, oil, and carbon color. The temperature at which the ink is applied depends on the type of ink being used. Higher temperatures allow the carbon and oils to become more thoroughly absorbed by the paper. The ratio of wax to oil primarily determines the hardness of the coating. Hectograph paper coating ink has a higher solids content to satisfy the use requirements of the process by which it duplicates or prints. The temperature at which the carbon and backing are applied to the paper determines to a large measure the characteristics of the finished paper, such as carbon thickness, hardness, and depth of penetration. Automatic temperature control contributes to higher quality and greater uniformity of production of all types of carbon paper. 3 figures. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

GODLOVE, I. H. Uniformity of grading of the American, British, and German light-fastness standards. Am. Dyestuff Reptr. 39, no. 7: P215-21 (April 3, 1950).

At the instigation of the Light-Fastness Committee of the American Association of Textile Chemists and Colorists, and the specific request of the A.A.T.C.C. Color Committee, the author examined the American, British, and German light-fastness standards exposed to sunlight and in the Fade-Ometer. Changes of color (fadings), measured spectrophotometrically and expressed in quantitative units of fading (fading indexes) in specified times, have been used to investigate the uniformity of grading of the three national sets of standards. The American standards, whether in the standard number of hours or in double this exposure time, were found to be definitely more uniformly graded than the British or German standards, especially in sunlight exposure. The American set as a whole was also much faster than the European standards. The smallest color difference (fading index) measured was 0.09 units, the largest 4.67 units. The over-all precision (day-to-day reproducibility in 31 repeats) was 0.09 units. For the standard number of hours, extreme fadings in a given national set were as follows in sunlight: American,

0.1 to 0.3, range 0.2 units; British 0.2 to 2.0, range 1.8 units; and German, 0.1 to 1.45, range 1.35 units. Corresponding ranges in Fade-Ometer exposures were 1.1, 3.1, and 2.6 units, respectively. Similar differences in favor of the American standards were found for double the number of hours. Mean deviations from the averages of each national set strongly favor the American over the European standards, especially in sunlight exposures. Tristimulus values were obtained automatically with a GAF Librascope tristimulus integrator (*cf.* Davidson and Imm, J. Optical Soc. Am. 39: 942-4 [1949]) upon examination of the unexposed and exposed standard dyeings in a G.E. (Hardy) recording spectrophotometer. 4 tables, 8 figures, and 9 references. E.S.

PHYSICAL TESTING—PAPER—COLOR

VILARS [J.] An instrument for measuring the whiteness of paper. Bull. assoc. tech. ind. papetière 4, no. 1: 18-23; discussion: 23-4 (March, 1950). [In French]

A description is given of the Photovolt or photoelectric reflection meter (models 610 and 660) for measuring whiteness, color, opacity, and gloss. 1 table and 4 diagrams. L.E.W.

PHYSICAL TESTING—PAPER—GLOSS

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. *Brown Instrument Division.* Continuous measurement of gloss and reflectance. Instrumentation 4, no. 3: 22 (October-December, 1949).

Reference is made to the installation of the Hunter gloss recorder on the supercalender for evaluating gloss uniformity and permitting the operator to adjust the controls to maintain the gloss at a uniform optimum value. The operation of the control instruments is described briefly. 2 illustrations. E.S.

PHYSICAL TESTING—PAPER—THICKNESS

CRAWFORD, E. A., and STRAIN, M. The beta-ray basis weight gage. Tappi 33, no. 4: 190-2 (April, 1950); *cf.* B.I.P.C. 20: 583.

A description is given of a recording indicator utilizing a radioactive isotope for the measurement of basis weight on paperboard. Experiments show that, using a radioactive source actuating a detector, the response was directly proportional to the intensity of the radiation. When consecutive layers of a material of uniform density are interposed between the ray source and the detector, the intensity of the beam diminishes as a function of the thickness of the sheet. Beta rays are used because they are less hazardous to health and provide a steady source of energy. No Geiger tubes are required. The unit is mounted on the machine after the calender stack to measure paperboard continuously, and the recorder can be so adjusted that lights will appear when the weight tolerance is exceeded. 1 graph. E.S.

PHYSICAL TESTING—PULP—BEATER PROCESSING

CLARK, JAMES D'A. Sheet density vs. freeness. Paper Ind. 32, no. 1: 83-4 (April, 1950).

With reference to the work by Laugher (*cf.* B.I.P.C. 19: 797), the author points out the error introduced when beating results are compared on the basis of freeness rather than sheet density. A table comparing the action of three beating instruments on southern kraft pine at a density of 0.65 g./cc. in accordance with TAPPI standard methods is included to em-

phasize this point. A miniature beater for treating pulp for testing purposes is considered unsuitable, because it is impossible to standardize a sharp cutting edge, whereas the laboratory kollergang simulates the heterogeneous cutting action of the heavy mill equipment and produces a stock fairly similar to mill-beaten pulp, as far as tangible sheet characteristics are concerned. 1 table. E.S.

PLASTICS—PAPER-BASE

LURIE, ROBERT, and VASILEFF, N. Low loss, arc resistant paper laminates. Am. Paper Converter 24, no. 4: 24, 43 (April, 1950).

By modifying a melamine-formaldehyde resin with hexamethylenediamine, a paper-base laminate has been prepared, the properties of which meet the specifications set forth in Army and Navy Specification Jan P-13 and LTS-E-5 type material. The effect of modification of the resin on the electrical and mechanical properties of the laminates is discussed. E.S.

SNYDER, FRANCIS H., SPIWAK, L., and MOYER, ALFRED E. The beater addition process for producing laminating papers. Tappi 33, no. 4: 87-90A (April, 1950).

The beater addition of a new type of water-insoluble phenolic resins (Synco 721) and some of the resulting laminates and their properties are described. Stocks prepared in this manner differ from off-machine saturated papers in that the fibers are bonded together with resin and not by hydrocellulose, which difference in structure results in significant changes in physical and molding properties, such as improvements in impact, tensile, and flexural strengths, cold punchability, machinability, and postforming. Some of the new developments include electrical and light-stable decorative grades, modifications with synthetic and natural rubber latices, low-cost core stocks for decorative laminates with hardboard pulps, a reduced fiber-resin combination for core stocks, overlay tissue and printed liner stocks, backing sheets for decorative laminates, asbestos filled stocks, honeycomb-core papers, and plywood masking overlays. Several of these developments are in commercial production. 2 tables. E.S.

PLASTICS—TESTING

KUENZI, EDWARD W. Testing of sandwich constructions at the Forest Products Laboratory. ASTM Bull. no. 164: 21-8 (February, 1950).

Testing methods in use at the Forest Products Laboratory are outlined for evaluating the suitability of sandwich constructions in aircraft and in panels proposed for housing; the second type is usually much thicker and weaker than sandwiches for aircraft. They are composed of aluminum or plywood facings on cores of expanded paper honeycomb or corrugated paper. 16 figures. E.S.

PRINTING AND PRINTER'S INK

ANON. Printers' paper problems. XI. How paper-makers maintain their standards. Indian Print & Paper 15, no. 62: 28 (January, 1950); *cf.* B.I.P.C. 20: 421.

The inconsistency of repeat orders was far greater 20 or 30 years ago, when the papermaker promised a "practical match," which was very often far from a true match and resulted in many arguments between producer and buyer. Since then, increased specialization of mills, laboratory and mill

control, and numerous new testing instruments have contributed to a greatly improved uniformity of successive deliveries. However, even with this care, still much depends on the personal skill and experience of the papermaker, and there are so many ways in which an order may go astray that slight variations will still be found. E.S.

NINTH GRAPHIC ARTS PRODUCTION YEARBOOK. Paper. Ninth Graphic Arts Production Yearbook: 273-343 [New York, Colton Press, c1950] *cf.* B.I.P.C. 18: 620-1.

Included in the section on paper in the present yearbook are the following articles, listed by authors and titles: Anon. Master paper selector, p. 274-6, 278-9, 282, 286; Anon. Paper sampler, p. 288-9 + 39 paper samples; Compton, Glenn C. New developments in paper, p. 290, 292; Overton, G. B. Grain direction, p. 294; Wehmhoff, B. L. Printability, p. 296; Butterworth, John A. Paper finishes, p. 297; Marquardt, Oswald F. Colored papers, p. 298; Anon. Blotting estimator, p. 300; Morris, Charles V. Selecting paper, p. 302, 304-6, 308, 310, 312; Anon. Ordering paper, p. 313-14; Anon. Weight per copy estimator, p. 316, 318, 320, 322, 324, 326, 328; Anon. Spoilage adaptor, p. 330; Ingram, Howard. Paper thickness calculator, p. 330b; Gottschall, Edward M. Roll weight calculator, p. 332, 334; Anon. Standard sizes and weights, p. 336; Anon. Envelope cutting chart, p. 337; Anon. Envelope sizes and styles at a glance, p. 338; Anon. Requirements of fine envelopes, p. 339-43. J.A.B.

SIMMONS, R. H. Printer's paper troubles. Paper Mill News 73, no. 15: 10, 12, 16, 18 (April 15, 1950).

The author discusses the effect of atmospheric conditions, sheet formation, thickness, smoothness, ink receptivity, offset and strike-through, picking, and color and two-sidedness on the printing results obtained with either the planographic, typographic, or the intaglio process. Mechanical troubles caused by fuzzy, torn, or cracked edges, edges which are not cut square or straight, calender cuts, slime holes, rolls which are not perfectly round or unevenly wound, poor splices, and poor handling during transit are also mentioned; papers showing any of these defects should be kept out of the pressroom. With increased press speeds, all the factors causing troubles in printing will be accentuated. E.S.

RAYON—ACETATE PROCESS

WILSON, D. L. The structure of textile fibers. X. The structure of cellulose acetate. J. Textile Inst. 40, no. 12: P1070-6 (December, 1949); *cf.* B.I.P.C. 20: 422.

A popular description of the peculiarities of the structure of cellulose acetate fibers is given. 6 figures. E.S.

RAYON—VISCOSE PROCESS

VOSTERS, H. L. Filtration of viscose and its influence upon the stress-strain properties of isotropic xanthate filaments. Svensk Papperstidn. 53, no. 2: 29-34; no. 3: 59-64 (Jan. 31, Feb. 15, 1950). [In English; German and Swedish summaries]

Equations are given for the determination of the filtering properties of viscose and a new method for determining the clogging constant has been developed. The standard method of the Fachgruppe Chemische Herstellung von Fasern Zst 1 is considered to give incorrect values. The clogging con-

stant for the same viscose depends upon the filtering pressure, the nature of the filtering medium, the total filtering surface, and the distribution of the holes. Attention is also drawn to the influence of the size distribution of the undissolved particles. Some general stress-strain properties of isotropic xanthate filaments are described as a function of viscosity and degree of ripening. An attempt is made to explain the mechanism of deformation by means of a simple mechanical model. The relationship of the filtering properties of viscose and the tensile strength and extensibility of isotropic xanthate filaments is established. 14 tables, 14 figures, and 35 references. E.S.

RESEARCH

DRAPER, A. J. M. Fundamental science and the paper trade. Paper-Maker (London) 119, no. 3: 181-2, 184 (March, 1950).

The author emphasizes the implications of advances in fundamental science on the future of the paper industry. His remarks are not intended as a criticism of British scientists in the paper trade, because it is fully understood that the average mill chemist will have little time for research work of a fundamental nature. However, he can keep himself informed by reading the literature and, although it is impossible to study all the journals, he will find a mass of information in the abstract journals and annual or quarterly reviews. To illustrate the author's point, a few previous fundamental researches are considered (the pH scale, the preparation of chlorine by Scheele and of urea by Wöhler, the discovery of the first coal-tar dye by Perkin) which were originally studied for their own sake and not for the purpose of producing commercial products, although they later attained a vast significance as such. In conclusion, recent trends in fundamental research on subjects connected with the paper industry are mentioned (cellulose, dyestuffs, rosin, and coal). The sole purpose of this article (written from the British viewpoint) is to bring about a realization of the importance of present fundamental researches, which should not be cast lightly aside, but should be given serious consideration for the benefit of the future industry. 24 references. E.S.

SALESMEN AND SALESMANSHIP

ANON. Paper products for industrial plant food service. Paper & Twine J. 24, no. 2: 11, 18-20 (April, 1950).

The paper salesman is reminded that practically any industrial plant in his territory is a logical outlet for paper food service items, such as cups, plates, containers, and serving trays, since most plants provide food service of some kind for their employees. 1 illustration. J.A.B.

ANON. Re-sale paper products. Paper & Twine J. 24, no. 2: 16-17 (April, 1950).

All department stores sell a number of paper and cordage items, and many stores maintain a regular paper department. The paper salesman who is in a position to offer a full line of resale items, from reputable manufacturers and with good service, may provide these retail items by contacting the various buyers in the departments where paper products are sold. J.A.B.

ANON. Restaurant paper specialties. Paper & Twine J. 24, no. 2: 9-10 (April, 1950).

Some of the paper products mentioned which are of possible interest to restaurants and hotels are place mats, printed doilies, finger bowl liners, cocktail coasters and napkins, portion cups, burger cups, and paper crab shells. 1 illustration. J.A.B.

LIPSMEYER, L. H. Self-service meat departments . . . and what they offer you. Paper Sales 10, no. 4: 20-1, 29-30 (April, 1950).

Paper salesmen with a knowledge of meat prepackaging materials can show grocers that the self-service type of meat selling is the most profitable because of increased sales, faster movement of the cheaper or economy cuts, constant availability of all meats, and better protection. In addition to the cellophane or other wrapping material used, the operators of self-service meat departments must be provided with meat boards, labels, heat sealers, and special cutters for transparent films. 1 illustration. J.A.B.

PAPER SALES. How and where to sell egg cartons. Paper Sales 10, no. 4: 18-19, 30-1 (April, 1950).

In addition to protecting eggs against breakage, the use of egg cartons increases sales, improves egg quality, and lowers the cost. Markets for egg carton sales include groceries, delicatessens, large dairy and chain store organizations, and farms where eggs are sold to retailers. In question-and-answer form, the cushioned carton, molded pulp carton, and flat-bottomed carton are described, their comparative advantages discussed, and their production explained. 5 illustrations. J.A.B.

THOMASSON, NELSON. Furniture manufacturers are my specialty. Paper Sales 10, no. 4: 22, 28-9 (April, 1950).

A paper salesman shows how he increases his sales and gives his accounts more complete service by equipping himself with a knowledge of their businesses, as well as his own. He cites specific examples of uses he has found for paper in the furniture business to replace burlap webbing, cotton products, and other materials. J.A.B.

SEMI-CHEMICAL PULPING PROCESS

PULP & PAPER. New neutral sulfite plant; Ontario mill now uses 75% hardwoods. Pulp & Paper 24, no. 4: 44, 46 (April, 1950); *cf.* B.I.P.C. 20: 588.

An illustrated description of the semichemical process at the corrugated board mill at Sturgeon Falls, Ont., is given; the mill used to make newsprint, but has been completely converted to the manufacture of 12-point corrugating board with a daily capacity of about 100 tons. The mill can utilize wood species rejected by other mills; about 75% of its wood supply is hardwood. 4 illustrations. E.S.

SETUP BOXES

PP. Box staying with paper and adhesives. Allg. Papier-Rundschau no. 1: 9-11 (Jan. 15, 1950). [In German]

The corner and end staying of upright boxes is illustrated by a number of examples. Upright boxes are made rigid by either adhesives or stitching wire and both methods have wide fields of application. However, wire stitching should never be employed for covered boxes, because the surface must be smooth. 6 figures. E.S.

SHIPPING CONTAINERS

ANON. Bag-in-a-can. Modern Packaging 23, no. 8: 151 (April, 1950).

The packaging of highly corrosive x-ray developers has been simplified by the use of polyethylene film inside metal cans. The liner bags are crimped

to the top seal of the can in such a way that when the top is punctured, the bag is also pierced. The new "Dental Dual-pack" contains all the developing solutions necessary for processing dental x-ray film; in one can is an improved developer, and in the other is the fixer solution with the hardener included. The corrugated-carton package saves 40% in weight and 33% in space over the glass bottles and cartons previously used. 3 illustrations. J.A.B.

BROWN, GEORGE I. Light density shipping problems. Shears 68, no. 688: 23-4, 72-3 (April, 1950).

The low density of most folding box shipments has resulted in threats by trucking and rail carriers to set up a new scale of rates for all folding paper boxes or to modify the existing rates to take density into consideration. This would increase shipping costs to the industry 10% or more. In an attempt to develop improved packing and shipping methods which would increase the density of shipping packages, a packaging survey was conducted by the Folding Paper Box Association of America, the results of which are reported. The committee's recommendations fall into the following divisions: better packing supervision and instruction, the use of mechanical or air pressure, changes in folding and packing methods, and more accurate ordering of shipping case sizes. In addition to increasing the density, these measures facilitate handling and stacking and reduce the possibility of damage. 2 tables. J.A.B.

HOFFMAN, ALFRED W., and JOHNDREW, ORVIS F., JR. Studies on fibre egg cases and inner packing materials. Shears 68, on. 688: 37-8, 40 (April, 1950).

A report is given of laboratory and transportation studies conducted by the U. S. Department of Agriculture to develop a new egg carton which will accommodate the increasing size of eggs. A comparison was made between a combination of a new style flat and a new style filler (standard height, but 1 $^{25}/_{32}$ inches square) with standard fillers and flats, using jumbo, extra large, large, and medium eggs (U. S. weight classes), and with turkey fillers and flats, turkey egg trays, and jumbo fillers and standard flats, using jumbo eggs. Incline-impact tests, vibrating-table tests, and transportation tests were carefully carried out, and the results are summarized in table form. In the packaging of jumbo, extra large, or large eggs, the new style fillers and flats were found to be superior to standard fillers and flats. Turkey fillers and flats were better than standard fillers and flats for jumbo eggs, but since the use of these would necessitate two different sizes, the Department has recommended the new style fillers and flats for the normal shipment of all eggs. 3 tables and 4 illustrations. J.A.B.

SHELTON MANUFACTURING COMPANY. Self-locking box with no bottom seam. Shears 68, no. 687: 47 (March, 1950); Paper Trade J. 130, no. 16: 55 (April 20, 1950); Fibre Containers 35, no. 5: 83 (May, 1950).

A new corrugated shipping container recently developed by the company is a self-locking box with no bottom seam, called "Shellock." A double thickness of corrugated at the bottom and sides makes the container exceptionally strong. 2 illustrations. J.A.B.

SHIPPING CONTAINERS—EXPORT PACKAGING

FERRIGGI, J. J. Packing for export to the Caribbeans. Brit. Packer 12, no. 3: 35-7, 39 (March, 1950); Paper Box Bag Maker: 100-2 (March, 1950).

The author, who recently made an extensive tour of the Caribbean area of South America, reports on the handling and the facilities for storing of the packaged products sent there by British exporters. In view of the congestion at the ports, bad handling, exposure to severe climatic conditions, uneven road surfaces, the possibility of landslides and floods, the great distances from port to destination, long delays, pilferage, and other unforeseen difficulties, nearly all the present packing practices were found to be entirely inadequate. Some of the suggestions made to exporters for improving this situation are: protect corrodible articles with plastic coatings where possible, secure heavy crates with tensional steel strapping, use cases sufficiently large to permit the use of cushioning material if needed, employ internal bracing and chocking which will prevent movement of the goods in transit without being so rigid that external shock will be transmitted to the contents, and arrange for the thorough testing of prototype packages wherever possible. 12 illustrations. J.A.B.

PHILPOT, JOHN C. Good packaging and presentation are essential in Canada. Paper Box Bag Maker: 245-7 (December, 1949); Paper Making and Paper Selling 68, no. 4: 23-4 (Winter 1949-50).

The retailing methods in Canada differ from those in the United Kingdom by the tendency to combine the functions of several types of retailing under one roof and the growing acceptance of self-service methods; hence, the successful Canadian package differs in many aspects from its British counterpart. Directions are given for the benefit of British exporters, particularly with reference to the problems of wholesale handling and the subdivision of export packs into shipping units. E.S.

SHIPPING CONTAINERS—FIBER DRUMS

ANON. New deal in drum liners. Modern Plastics 27, no. 8: 112-13 (April, 1950).

Reference is made to the use of polyethylene film for lining steel or fiber drums and rectangular shipping containers; the advantages of these liners include better product protection, reduction in shipping charges because lighter-weight containers can be employed, and elimination of costly drum cleaning and reconditioning. The rapidly growing list of items packaged in this manner includes foods, petroleum products, and chemicals. 8 illustrations. E.S.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

GREEN, ALBERT L. Recent progress in prevention of damage. Fibre Containers 35, no. 4: 68, 70, 72-5 (April, 1950).

The author discusses recent progress in claim prevention, the extraordinary efforts by the railroads to improve service through efficient training of all employees, the activities of the inspection bureaus, the standards of the glassware manufacturers, the program of the Porcelain Enamel Institute, and some problems of car shock and vibration on lading. E.S.

SHIPPING CONTAINER INSTITUTE. S.C.I. freight loss and damage study. Fibre Containers 35, no. 2: 20, 22, 27-8, 30, 32; no. 3: 60-5; no. 4: 42, 47-8, 50, 52, 57, 59-60, 65-6 (February-April, 1950).

The full text of the final report of the now defunct S.C.I., dated Feb. 25, 1949, is given. It covers the purpose of the formation and aims of the Insti-

tute (including the 16 companies which composed the membership), a description of the test shipment program which was carried on continuously for two and one-half years, the results of the study (range of commodities involved; extent, types, and causes of observed damage; relative importance of damage causes; ratio of claims to revenue; and general analysis tables), and the public reaction. 19 tables and 14 figures. [The S.C.I. was discontinued on May 17, 1949; in September, 1949, a joint study by the railroads and the Fibre Box Association was instituted. The current joint program of a purely fact-finding nature is briefly discussed editorially by *Fibre Containers* at the end of the S.C.I. report.] E.S.

SILICATE OF SODA

MERRILL, REYNOLD C., and SPENCER, ROBERT W. Sorption of sodium silicates and silica sols by cellulose fibers. Ind. Eng. Chem. 42, no. 4: 744-7 (April, 1950).

Sorption of both alkali and silica from sodium metasilicate, $Na_2O \cdot 3.37SiO_2$, N-Sol A, and a sulfuric acid-treated silica sol was measured at 25° C. for bleached sulfite, soda, kraft, and groundwood cellulose pulps. Similar data on sodium hydroxide are given for comparison. Both alkali and silica are sorbed by the cellulose fibers, but the amount of the former sorbed is usually much greater than that of the latter. The mechanisms of the sorption probably involve van der Waals forces, hydrogen bonding, and chemical reactions with metal oxide impurities. Practical applications of the data are discussed (minimizing alkali staining of paper by silicate adhesives, increasing the retention of cellulose fibers on the Fourdrinier wire, coagulating them in the saveall, etc.). 4 tables, 8 figures, and 15 references. E.S.

STAINS AND STAINING

GOLDTHWAIT, CHARLES F., SMITH, HERBERT O., and ROBERTS, FLORENCE T. Special dyeing of cotton on the seed gives visual evidence of changes during fiber development. Textile Research J. 20, no. 2: 100-4 (February, 1950); *cf.* B.I.P.C. 17: 725-6.

A process of differential dyeing employed to distinguish between thick- and thin-walled cotton fibers has now been utilized to show visually that the drying of normal cotton fibers for the first time—as when the boll opens in the field—greatly affects their dyeing properties. The effect was observed as a pronounced color difference when one lock from a nearly mature boll, cut open in the laboratory, was dried and another lock was kept wet, and both were dyed in the same dye bath at the same time. The dried cotton dyed mainly red and the undried dyed green. The change in the cotton cellulose which caused the difference is undoubtedly submicroscopic, and takes place in addition to the changes visible in the microscope which are familiar in fibers that have dried normally on the plant. A significant feature of the submicroscopic change can be inferred from the dyeing behavior considered in relation to current views of the mechanism of direct dyeing—that is, undried fibers from a cotton boll are shown by a new technique to be more porous than fibers which have dried in the boll, and the thin-walled fibers in ordinary cotton are similarly more porous than the thick-walled fibers, at least while wet in a hot dye bath. It follows that the differential-dyeing effect with cotton fibers is determined by cellulose structure in combination with specific properties of the two dyes employed. 9 references. E.S.

STARCH

ANON. The adhesive problem for corrugated and solid fiber-

board. Allg. Papier-Rundschau no. 1: 5-7 (Jan. 15, 1950). [In German] *cf.* B.I.P.C. 18: 470-1.

Details of the Stein-Hall process for nonweatherproof and weatherproof corrugated and solid fiberboard are given. E.S.

DVONCH, WILLIAM, YEARIAN, H. J., and WHISTLER, ROY L. Behavior of low molecular weight amylose with complexing agents. J. Am. Chem. Soc. 72, no. 4: 1748-50 (April, 1950).

When amylose is acid-hydrolyzed to a D.P. of about 20-40, it can no longer form insoluble complexes with nitrobenzene, *n*-amyl acetate, and *n*-amyl methyl ketone. However, it is still capable of forming an insoluble complex with *n*-butyl alcohol and to some extent with 2-nitropropane. The e.m.f. of iodine-complex formation varies inversely with the D.P. of amylose, and with a D.P. of less than about 50 it is not possible to separate surface adsorption from complex formation. 2 tables, 2 figures, and 12 footnotes. E.S.

HIGGINBOTHAM, R. S. The fractionation of starch. Part III. The amylose-iodine reaction. J. Textile Inst. 40, no. 12: T783-94 (December, 1949); C. A. 44, no. 8: 3729-30 (April 25, 1950); *cf.* B.I.P.C. 20: 272-3.

The amounts of iodine absorbed by potato amylose at 25° C. were determined for free iodide concentrations ranging from 0.002 to 0.05 *N* and for free iodine concentrations of 10^{-6} to 1.5×10^{-2} *N*. The absorption of iodine did not reach a limiting value other than that imposed by the limited solubility of iodine; the view that the absorption takes place in two stages was confirmed. In the first stage, during which the absorption spectrum of the absorbed iodine remains constant, there is no simple relation between iodine absorbed and free iodine, but in the second stage, in which the spectrum changes in a manner suggesting that the additional iodine is being forced into amylose helixes which already contain iodine, the amount of iodine absorbed is a linear function of the logarithm of the free iodine concentration. Experimental details are given for the preparation of materials, determination of the activity of molecular iodine, potentiometric titration, and the spectrophotometry involved. The results are given in tabular and graphical form. 7 figures, 3 tables, and 17 references. J.A.B.

HIGGINBOTHAM, R. S. The fractionation of starch. Part IV. The amylopectin-iodine reaction. J. Textile Inst. 40, no. 12: T795-808 (December, 1949).

The amounts of iodine absorbed by sago, tapioca, potato, maize, and waxy maize amylopectins, and by glycogen, were measured at concentrations of free iodine ranging from 10^{-6} to 10^{-1} *N*, the effect of varying the iodine concentration over the range 0.01 to 0.5 *N* was examined, and the relation of iodine to iodide absorbed was determined where possible. When the concentration of free iodine was sufficiently high, the amylopectins absorbed as much iodine as amyloses, and it was inferred that amylopectins react with iodine partly by a helix mechanism involving chains of iodine molecules and triiodide ions, and partly by adsorption of single iodine molecules or single triiodide ions. Spectrophotometric data support this view. The proportion of iodine bound by the helix mechanism varies with the total amount of iodine absorbed and with the identity of the amylopectin. These variations may be related to the distribution of branch lengths in the amylopectins. 6 tables, 13 figures, and 14 references. J.A.B.

STATIC ELECTRICITY IN PAPER

PENNELL, M. S. Neutralization of static electricity. Paper Trade J. 130, no. 15: 33-4, 36-7 (April 13, 1950).

The author explains how static charges on the surface of paper can be eliminated by means of Chapman electric neutralizers. The intensity of the electric charge per unit of area depends on the composition of the paper, the finish, the moisture content of the paper, and the relative humidity prevailing in the room. In general, the higher the dielectric characteristics of the paper, the more readily it becomes charged and the longer it will hold the charge; paper is an insulator and not a conductor of electricity. The principle of the Chapman electric neutralizer is to provide a localized alternating field through which the charged material passes; it thereby loses its static charge instantly, and the electrical balance is restored. The types of transformers for high- and low-voltage static neutralizers and different types of inductors for various purposes are described. The proper installation of the inductors is important; at least one of them should be located as near the final delivery end as possible, because after static is removed from the material its subsequent travel may generate another charge. Sometimes it becomes necessary to use several applications, because static may cause trouble at several points in the travel of the sheet through the machine. Under ideal conditions, the inductor is applied under or over the web or sheet of paper where nothing intervenes and where there is an air space on the opposite side of the paper, so that the charge in the paper at the point of application is a free charge rather than a bound one. 8 figures. E.S.

STREAM POLLUTION

WASHINGTON STATE POLLUTION CONTROL COMMISSION. Minimum requirements for the control of industrial wastes. Sewage Ind. Wastes 22, no. 4: 514-20 (April, 1950).

The requirements established by the Commission cover fundamental procedures for in-plant prevention and reduction of industrial waste discharges for a number of industries, including saw mills, veneer mills, and other wood handling, and pulp and paper mills, exclusive of sulfite waste liquor, which will be handled as a separate item. Fiber loss from beater and machine operations must be reduced to 1% of production and bark and knotty rejects be kept entirely out of the state waters, according to these requirements. E.S.

SULFATE MILLS

ANON. Progress report on H. R. MacMillan Export Co., Ltd. Pulp Division, Nanaimo plant. Paper Trade J. 130, no. 15: 13-14 (April 13, 1950); *cf.* B.I.P.C. 19: 659-60.

The new sulfate mill on Vancouver Island was scheduled to start operations in May, but exceptionally severe winter conditions retarded the construction work. At the end of March the plant was about 70% completed. A 178-inch Fourdrinier pulp machine and a Fläkt drier are completely installed in the machine room. The last section of the mill will be the bleach plant, scheduled to operate in the late fall; until it is ready, the plant will produce unbleached sulfate pulp. The principal raw material will be Douglas fir chips from the company's lumber mills, which are at present shipped to other pulp plants on the Pacific Coast. 8 illustrations. E.S.

EVANS, JOHN C. W. Fraser's bleached sulphate project. Pulp Paper Mag. Can. 51, no. 4: 62-80 (March, 1950); *cf.* B.I.P.C. 20: 431.

Following a brief outline of the origin and development of Fraser Companies, Ltd., a profusely illustrated description of their latest unbleached sulfate mill at Newcastle, N.B., and the bleaching plant at Edmundston, N.B., is given. E.S.

PAPER INDUSTRY. Fraser Companies' Newcastle kraft mill and Edmundston bleachery. Paper Ind. 32, no. 1: 34-42 (April, 1950); *cf.* B.I.P.C. 20: 431.

An illustrated description of the installations of the new 120-ton sulfate mill at Newcastle, N.B., is given, whose output is transferred to a new bleachery at Edmundston, N.B. Lists of the principal pulp-mill and bleach-plant equipment and their manufacturers are appended. 3 flowsheets and 14 illustrations. E.S.

PULP & PAPER. Kraft mill and bleachery described; new Fraser plants. Pulp & Paper 24, no. 4: 48-9, 51-2 (April, 1950).

The description is similar to that given in the preceding reference. 4 flowsheets and 6 illustrations. E.S.

SULFITE PROCESS—MAGNESIUM BASE

BAKER, R. E., and WILCOXSON, L. S. Magnesia-base sulphite pulping; a progress report. Tappi 33, no. 4: 187-90 (April, 1950).

This progress report on the magnesia-base sulfite pulping process is divided into a discussion of the five main steps of the cycle: acid making, cooking, washing, evaporation, and burning. Losses are indicated, and it is expected that further progress will be made to minimize them to increase the efficiency of the process. 1 table and 4 references. E.S.

SULFITE WASTE LIQUOR

ANON. Research project on spent sulphite liquor and torula yeast planned at U. of Wyoming. Paper Ind. 32, no. 1: 48 (April, 1950); Tappi 33, no. 4: 40A (April, 1950).

Several Wisconsin sulfite mills may build torula yeast plants for processing their sulfite waste liquor in the near future; the disposal of the yeast effluent will then become a problem, because it does not respond satisfactorily to the conventional sewage treatment. The Sulphite Pulp Manufacturers' Research League has established a project at the National Resources Research Institute at the University of Wyoming to study the possible commercial use of sulfite waste liquor and yeast effluent as a binder for making briquets from coal dust and for road surfacing. Any results obtained will be made available to all members of the League. E.S.

SCHOLANDER, AXEL. Ash and flue gases from the burning of sulfite waste liquor. Svensk Papperstidn. 53, no. 2: 35-8 (Jan. 31, 1950). [In Swedish; English summary]

The amounts and concentrations of ash and sulfur dioxide in the flue gases from burning evaporated sulfite waste liquor are discussed. In general, liquor with 50% dry solids or in the form of a 100%-dry powder contains 5-8% lime, 5-8% total sulfur, and 7-15% ash, depending upon the degree of neutralization and preceding evaporation conditions. Analyses of the ash are tabulated when sulfite waste liquor is burned alone, and in admixture with wood. A method for determining the carbon in the ash is given. Reference is made to the damages caused by the ash and sulfur dioxide, the latter

from a corrosion angle in the mill, as well as from the aspect of the legal implications of air pollution. A proposed process for scrubbing the flue gases has been investigated on a laboratory scale. The experiments show that it is theoretically possible to have all the sulfur dioxide generated from burnt sulfite waste liquor absorbed by its own ash, if no oxidation takes place. However, when the calcium oxide, calcium carbonate, and calcium sulfide in the ash are oxidized to calcium sulfate, only 50% of the generated sulfur dioxide is absorbed. Studies with an industrial flue-gas scrubber at a mill which evaporates and burns its sulfite waste liquor showed only a 30% gas absorption, whereas 60% of the sulfur was oxidized to sulfate. The discharged ash water was found to be alkaline, and only 50% of its absorption capacity had actually been utilized. Structural improvements in the absorption surfaces of the scrubber will no doubt result in a better efficiency of operation. The advantages and disadvantages of a scrubber installation must be balanced against each other and the local demands on air-pollution abatement taken into account. It must also be realized that the scrubbing process changes the air-pollution problem to one of water pollution. 4 tables, 2 figures, and 15 references. E.S.

SCHOLANDER, AXEL. Some aspects of the liquor-recovery problem in sulfite mills. Svensk Papperstidn. 53, no. 4: 95-102 (Feb. 28, 1950). [In Swedish; English summary]

The recovery of sulfite waste liquor is important for both alcohol and evaporation plants. The concepts of liquor recovery, the yield of dry substance U, and the concentration quotient f (introduced by Nilsson; *cf.* B.I.P.C. 12: 161) are defined, and their relation to the amount of liquor recovered, i.e., the relative volume of liquor (recovered as percentage of the original liquor in the digester) is discussed. Economic limits of liquor recovery can be expressed as economic concentrations at which the recovery should be stopped. The economic concentrations depend upon pulp quality, alcohol and fuel prices, evaporation costs, and upon the selection of an alcohol or an evaporation plant, or a combination of both. A table is given which shows the economic concentrations under various conditions. Calculations of the liquor-recovery process are made by means of a model with continuous flow; the calculated recovery results are compared with mill data given in literature. The calculation method is applied to a practical liquor-removal curve and it is shown that the method can be used for characterizing such curves. Constants are obtained in this manner, by means of which it is possible to compare not only the final result expressed in terms of U and f, but also the recovery curves with one another. The economic results of three recoveries are compared; they indicate the importance of a high dry-substance recovery at as high a concentration as possible. The principal factors affecting the recovery process are discussed briefly. Temperature and density distribution should be such that the denser liquor is below the lighter one. If a large difference in density between the original and wash liquors is desired, hot water should be admitted from above to the vessel in which the liquor is separated from the pulp, or cold concentrated wash liquor should be pumped into the vessel from below. A well-defibered pulp (such as is obtained by blowing the digester contents into pits) will improve the liquor recovery, as well as uniform packing of the chips; forced-liquor-circulation piping inside the digesters causes poor packing. With regard to the shape of the digester, high and narrow constructions would seem to be preferable to low and broad ones; however, experience with diffusers in the sulfate industry would indicate the opposite. The shape and dimensions of the vessels used for displacement washing certainly play an important role; however, systematic investigations have not yet been made in the sulfite industry. 1 table, 12 figures, and 9 references. E.S.

SULFUR

WEST, JAMES R. Thermodynamic properties of sulfur. Ind. Eng. Chem. 42, no. 4: 713-18 (April, 1950).

Data on the critical properties, the vapor pressure, and the molecular species present in sulfur vapor were compiled by calculation. Enthalpy and entropy computations were made for the saturated liquid, for the vaporization process, for the saturated vapor, and for the superheated vapor with allowances for dissociation. Similar calculations were made on the volume. The results are shown in tabular and graphical form. 7 tables, 2 figures, and 14 references. E.S.

SURFACE PHENOMENA

SONDERS, L. R., ENRIGHT, D. P., and WEYL, W. A. Wettability, a function of the polarizability of the surface ions. J. Applied Phys. 21, no. 4: 338-44 (April, 1950).

The wettability of crystals, glasses, and even of water itself can be temporarily decreased by bringing ions of high polarizability into their surfaces. Base-exchange experiments are described where the hydrogen ions present in the surface layers of bentonite (a clay mineral of high exchange capacity) and of a soda-lime glass are replaced by different cations. This substitution seems to have no particular effect on the hydrophilic and rheological properties of the carriers as long as their surfaces are kept in contact with water. After drying, however, the surfaces which contain ions of high polarizability become hydrophobic, at least temporarily. A porous clay film will no longer absorb water instantaneously after having been treated with Ni^{2+}, Mn^{2+}, Hg^{2+}, or similar ions with incomplete outer electron shells. Contact angles with water up to 70° could be observed for a short period for Hg^{2+} and Pb^{2+} clays. Glass capillary tubes which have been treated with nonnoble gas-type ions show a capillary rise which is much smaller than that observed with the tubes which have been treated with hydrochloric acid and water only. This depression of the capillary rise, too, is temporary and can be observed only if the glass wall has been thoroughly dried previous to the experiment and if the capillary rise is measured in the upward direction. An explanation is presented for these and allied phenomena on the basis of the polarization of ions in the strongly asymmetrical forcefields of interfaces. The experiments are correlated with the hysteresis of the contact angle and with observations concerning adhesion phenomena and catalytic activities of heavy metal ions at interfaces. 5 tables and 5 references. E.S.

SWELLING AND HYDRATION

KASBEKAR, G. S. Swelling of cellulose in solutions of acids. Indian Pulp and Paper 4, no. 8: 313-15 (February, 1950); *cf.* B.I.P.C. 20: 352-3.

A review is given of the literature on the swelling of cellulose in various concentrations of sulfuric and phosphoric acid. A great similarity was noted between the behavior of these acids and of neutral salt solutions with respect to cellulose. 56 references. J.A.B.

TARIFF

PERRY, HENRY J. Your job—your future—your security. Paper Trade J. 130, no. 17: 19-20 (April 27, 1950).

The effect of tariff cuts on the pulp and paper industry are discussed. E.S.

TURCOTTE, LAWSON. Status of the Pacific Coast pulp and paper industry. Tappi 33, no. 4: 70A, 72A (April, 1950).

The author emphasizes the excellent technical, physical, and financial status of the pulp, paper, and allied industries on the Pacific Coast, and the need for adequate tariff protection, if the industries are to enjoy the great future to which they are entitled. E.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

DAVIS, F. V., FINDLAY, J., and ROGERS, E. The urea-phosphoric acid method of flameproofing textiles. J. Textile Inst. 40, no. 12: T839-54 (December, 1949).

It has been confirmed that a flameproof finish which is resistant to hot water washing and even to mild soap scouring can be imparted to cellulosic fabrics by treatment with urea and phosphoric acid, followed by heating at 130-175° C. The efficiency of the flameproofing was shown to depend on the phosphorus content of the treated material, and for complete flameproofing a minimum of 3% of phosphorus is necessary. The evidence points to surface esterification of the cotton cellulose as the reason for the flameproofing effect and indicates that the ester present in the washed fabric is the ammonium salt of cellulose orthophosphoric acid, although the products of heating urea and phosphoric acid to the curing temperature have been shown to be essentially diammonium pyrophosphate and cyanuric acid. 11 tables, 1 graph, and 11 references. J.A.B.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

PARTRIDGE, H. W., and KEY, G. E. Rotproofing. J. Textile Inst. 40, no. 12: P1077-89 (December, 1949).

The author discusses the organisms which attack textiles, rotproofing agents and procedures, and methods for testing the resistance to attack. 6 tables, 4 figures, and 5 references. E.S.

VANILLIN

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. IX. Some new esters of syringic and protocatechuic acids. J. Am. Chem. Soc. 72, no. 4: 1743-6 (April, 1950); *cf.* B.I.P.C. 19: 878.

A number of esters of syringic and protocatechuic acids have been prepared and tested for their toxicities toward representative micro-organisms; the results are tabulated. The protocatechuic acids were more effective in low concentrations than the syringates. The ultraviolet absorption spectra of both types of esters were also determined. 3 tables, 2 figures, and 9 footnotes. E.S.

VISCOSITY

MARK, H. Viscosity and molecular weight of macromolecular solutions. Monatsh. 81, no. 1-2: 140-50 (February, 1950). [In German]

The author reviews the development of an empirical relationship between dilute solution viscosity and molecular weight of high polymers, leading to the generalized form of the Staudinger equation, $A = KM^a$, where A is the viscosity number (intrinsic viscosity), M is the molecular weight, K is a constant characteristic of the system, and the exponent a, although not en-

tirely independent of the molecular weight, has an approximately constant value over a considerable range. Experimental values for K and a are tabulated for ten different macromolecular solutions, a ranging in value from 0.62 to 1.5. The attempts to provide a sound theoretical basis for this empirical relationship are also reviewed, starting from the Einstein equation relating to the specific viscosity of suspended spheres and describing the modifications which have been introduced by various workers because of theoretical considerations of the size and effective shape of long chain particles, and the complications introduced by the movement of liquid through, as well as around, the particles. It is shown that differences in the degree of coiling may theoretically account for values of a ranging from 0.5 to 1.5. 3 tables and 25 footnotes. M.A.H.

WASTE HEAT

DEAN, D. K. Recovery of waste heat in pulp and paper mills. Tappi 33, no. 4: 195-201 (April, 1950).

The possibilities of recovering heat from various pulp and paper mill operations and the necessary equipment are discussed. Four types of blowdown recovery systems are outlined. In the sulfite process sulfur dioxide can also be reclaimed. Appreciable amounts of heat can be obtained from digester relief, in deinking plants, and from the paper-machine room. The application of the steam accumulator is considered. 9 figures. E.S.

FOSTER WHEELER CORPORATION. Heat recovery at St. Regis paper mills. Heat Eng. 25, no. 5: 87-93 (May, 1950).

A discussion is given of the advantages and disadvantages of the four types of heat-recovery systems which are used for condensing digester blowdown steam and transferring the heat to wash water; they are: the direct contact system (not suitable for most paper mills), the surface-condenser system, the liquid-to-liquid system, and the vapor-to-liquid system. In their selection, consideration must be given to the individual requirements and type of operation of the mill, the amount of heat to be recovered, first cost, ease of operation, and maintenance, including scaling of the heating surfaces and quantity of pulp particles in the carry over. The St. Regis Paper Co., Kraft Paper Division, selected the surface condenser system for their Alabama Pulp and Paper Co. mill and the flash-type recovery system for their Florida Pulp and Paper Co. mill, both at Pensacola, Fla. 7 figures. E.S.

WATER AND WATER TREATMENT

ANON. Clyde Paper Company Limited instal new water purification plant. World's Paper Trade Rev. 133, no. 7: 453-4, 459-62 (Feb. 16, 1950); Paper-Maker (London) 119, no. 3: 175-7 (March, 1950).

A detailed description is given of the new water purification plant at the Rutherglen Mill of the Clyde Paper Co., Scotland, which manufactures newsprint, coated papers, and esparto writing and printing papers. The plant was designed and supplied by the Permutit Co., Ltd., London, to handle three million gallons of water daily; it incorporates coagulation, mechanical floc formation, sedimentation, rapid gravity filtration, and final pH correction. 6 illustrations in the first reference; 2 illustrations and 1 diagram showing general layout in the second. E.S.

WATER-MARKS

ALLGEMEINE PAPIER-RUNDSCHAU. Watermarks of today. Allg.

Papier-Rundschau no. 3: 117-25 (Feb. 15, 1950). [In German]

The watermarks of 51 different German paper mills are reproduced. E.S.

[FACHKUNDE-KARTEI] Watermarks. Allg. Papier-Rundschau no. 4: 176 (Feb. 28, 1950). [In German]

The difference between genuine and artificial watermarks and their differentiation are explained. This is chart WP 2 of a series. E.S.

KORN, R. Standard watermarked papers. Allg. Papier-Rundschau no. 3: 93-5 (Feb. 15, 1950). [In German]

The author discusses the prewar German standards for important document and deed papers and emphasizes the need for their speedy restoration. All such papers had to carry officially accepted watermarks which were registered at the Materialprüfungsamt (bureau of standards) at Berlin-Dahlem. A list of the accepted watermarks and their manufacturers (as of 1944) is given. E.S.

KOTTE [HANS] How the watermark arrived in the world. Allg. Papier-Rundschau no. 3: 90-3 (Feb. 15, 1950). [In German]

The origin of watermarks is not known, although it is an established fact that they are an early European invention and were never found on the Asiatic and North African products. The author, in a historical study, tries to explain their use as protective trade-marks, which the mills making high-grade products introduced to protect the reputation of the quality of their papers. Early documents are available from which it can be gathered that the quality of the early papers was not always satisfactory and it was not easy to differentiate the good products from their poor counterparts. Watermarks were impressed upon the wet paper sheet during its manufacture and and could not be forged subsequently. In 1826, John Marshall in England invented the dandy roll for watermarking machine-made papers. An expert can readily differentiate the two kinds. In conclusion, brief reference is made to artificial watermarks applied to the finished sheet. 6 reproductions of watermarks, including the three earliest known designs ascribed to the Fabriano paper mill in Italy. E.S.

RENKER, ARMIN. Fine paper and watermarks. Allg. Papier-Rundschau no. 3: 95-6 + 1 watermarked sheet (Feb. 15, 1950). [In German]

Brief reference is made to the development of the fine paper industry in the Rhine provinces, some of the outstanding papermaker families, and their watermarks. 5 figures. E.S.

RENKER, ARMIN. The signs in the water, a papermaker's tale. Allg. Papier-Rundschau no. 3: 89 (Feb. 15, 1950). [In German]

Imitating the style of fairy tales and beginning "Once upon a time," the author relates the conversion of an old oil mill to a paper mill by an enterprising son, much against the will of the old oil miller, and the inspiration for watermarks which the father gained by staring at the strange figures formed by sand and mud at the bottom of the mill ponds. This is not a historical record, but the author's suggestion for the origin of watermarks. E.S.

WEISS, KARL THEODOR. The significance of the law of designs

in pairs for water mark research. Allg. Papier-Rundschau no. 4: 164-6 (Feb. 28, 1950). [In German]

In a somewhat philosophical vein, the author postulates that all historical watermarks appeared in pairs and that it is incorrect to base any research or study on individual designs. 4 illustrations. E.S.

WEISS, WISSO. Cultural-historical meditation on the watermark problem. Allg. Papier-Rundschau no. 4: 162-3 (Feb. 28, 1950). [In German]

The author establishes a relationship between the old watermark designs and certain local, family, or historical happenings, trends in thought, innovations, etc., which the expert can evaluate in the study of the cultural history of a nation or a certain cross section of it. E.S.

WAXES

KURTH, E. F. The composition of the wax in Douglas-fir bark. J. Am. Chem. Soc. 72, no. 4: 1685-6 (April, 1950).

The wax extracted with hexane from Douglas fir bark was examined for its properties and chemical constituents. Based on the saponification products, this wax contains approximately 20% lignoceryl alcohol, 60% lignoceric acid, and 20% ferulic acid (4-hydroxy-3-methoxycinnamic acid). Phytosterol is a minor constituent, and oleic acid may be present. The acid constituents are present in both the free and combined states. 6 references. E.S.

WET STRENGTH

MAXWELL, C. S., and REYNOLDS, W. F. Permanence of wet strength paper. Tappi 33, no. 4: 179-82 (April, 1950).

The permanence of wet-strength paper is discussed from two angles: permanence of the wet-strength properties and permanence of the paper itself. The factors mentioned that affect the permanence of the wet-strength properties are: nature of the wet-strength agent, pH of the paper during storage, temperature and humidity during storage, degree of cure of the wet-strength agent, and action of micro-organisms. In regard to the permanence of wet-strength paper itself, it is pointed out that many of the tests established for predicting the permanence of normal paper are unreliable when applied to the usual wet-strength papers. Tests that are affected are disperse viscosity, copper number, extracted pH, and folding endurance before and after oven aging. 1 table, 5 figures, and 10 references. E.S.

WHITE WATER

KOMINEK, E. G. Chemical treatment of white water. Ind. Eng. Chem. 42, no. 4: 616-19 (April, 1950).

White water is effectively clarified by chemical treatment in rapid-rate sedimentation units (Cyclators). Operations in board mills indicate that fiber losses can be reduced to about 0.1%, with the value of the recovered fiber defraying essentially all the operating expenses of the plant. Pilot-plant studies have demonstrated that tissue-mill wastes and deinking wastes can also be clarified by chemical treatment. Sedimentation units are subject to operating difficulties caused by entrained air or thermal upsets, which make it necessary to consider the installation of air separation chambers and of an equalization tank in designing a plant for treating white water. 4 tables, 2 figures, and 3 references. E.S.

WOOD—DECAY

CREAMER, GEORGE B. Wood decay. Pulp Paper Mag. Can. 51, no. 4: 86-90 (March, 1950).

The loss to the pulp and paper and other wood-using industries caused by fungal decay, although impossible to determine accurately, is known to be enormous. Nevertheless, relatively few mills seem to have taken advantage of the little that is known about methods of reducing this loss. A review of this information suggests that damage is greatest when rotting logs are in a position to infect sound logs of 30 to 40% moisture content. The methods of minimizing this loss include peeling the logs in the bush to obtain quick drying, sorting out infected logs for immediate use after arrival at the mill, stacking the remainder in clean, well-ventilated piles, and using these piles in rotation, so that no wood is stored for much longer than a year. 4 tables, 4 figures, and 17 references. E.S.

WOOD DISTILLATION

JENSEN, WALDEMAR. A study of the thermal processes in the pyrolysis of birch wood. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 1: 3-9 (January, 1950). [In English]

The author used an electrically heated, well-insulated horizontal tube with a 96-mm. inside diameter and a heating zone 415 mm. in length, as an oven in his experiments. Thermometer readings were taken when the oven was empty and when charged with wood; in both cases a constant electric current was maintained for the duration of the experiment. An evaluation of the amounts of heat energy generated during the process of carbonization was obtained by establishing a heat balance for the process and solving the equation for intervals of 10 minutes by substituting the experimental data. The results indicate that it is extremely difficult to explain the thermal processes during wood carbonization with a high degree of accuracy; the measurement of temperature presents a particularly complicated problem. In the beginning of the process, great variations in the temperature of the carbonizing matter are encountered. The surfaces of the test specimens which are turned toward the hot wall of the oven are the first to reach a carbonization temperature, whereas a thermometer inside the carbonizing matter shows considerably lower temperatures. The temperature readings at the beginning of the carbonization reactions can, therefore, not be considered accurate. However, when the reactions have spread through the entire material, the readings become more reliable and indicate that the reaction maximum lies within the temperature range of 275-425° C. The calculations of the thermal process indicate that, as a result of exothermic reactions, birchwood on carbonization liberates a heat quantity of approximately 300 kcal./kg. ovendry wood, which figure is roughly accurate within ±10%. Klason, in his classic study (*cf.* Arkiv Kemi, Mineral. Geol. 5, no. 7: 1-42 [1913]), obtained the following values for the heat of reaction in the carbonization of birchwood at atmospheric pressure: 258.6 kcal./kg. after eight hours', and 340.9 kcal./kg. after two weeks' distillation, which is in rather good agreement with the present values. The data obtained by Widell (*cf.* Kgl. Svenska Vetenskapsakad. Handl. no. 199: 1-35 [1948]), who also used electric heating in his experiments, differ considerably from those given in the present investigation; however, the two sets of results substantiate each other with regard to order of magnitude. 6 tables, 2 figures, and 6 references. E.S.

WOOD OPERATIONS

ANON. How Spruce Falls does it; use of sloops is a distinctive technique. Pulp & Paper 24, no. 4: 60, 62, 64, 66-7 (April, 1950).

An illustrated description of the logging techniques of the Spruce Falls Power & Paper Co., Kapuskasing, Ont., is given. Mechanization is gradually being introduced and adjustments are made according to local conditions. Tractor-drawn sloops, a type of sled, serve as key units for the movement of pulpwood from the forest. An ingenious system of wooden rails for swampy muskeg country has been devised for the use of small trucks carrying supplies and personnel; this saves the cost of building gravel roads. In conclusion, reference is made to the cutting and reforestation program of the company, including a forest nursery. The wood operations are based on a 100-year cycle; black spruce is the most abundant species, with about 10% balsam and 15% white spruce. 17 illustrations. E.S.

GEIGER, D. W. Forestry and the medical student. Pulp Paper Mag. Can. 51, no. 4: 118, 120, 122 (March, 1950).

The author describes the mutual benefits resulting from the employment of medical students in woods operations (either as first-aid attendants or as regular employees assuming the additional responsibilities of first aid and sanitation), where such services are not otherwise available. The limitations of such responsibilities are outlined; such a program should receive the sanction and co-operation of the company physician. E.S.

WOOD TRANSPORTATION

CALLIN, GEORG. The floating of birch and aspen. Svensk Papperstidn. 53, no. 3: 51-8 (Feb. 15, 1950). [In Swedish; English summary]

The commercial utilization of birch and aspen, which has become imperative in Sweden, depends upon the possibility of floating these two wood species. Following a brief literature survey of the work by other investigators, the author describes his own experiments in northern Sweden with various treatments for improving the floatability of these woods. In the case of birch, the best results were obtained when the cutting faces were impregnated after felling. Logging must be done in a special manner, according to which the tree is allowed to lie and season with its top intact (leaf-felling). If there are good short waterways, birch can then be floated in unbarked condition. Aspen has opposite floating properties. Best results are obtained when it is barked immediately after felling and allowed to dry for some time before floating. The possible reasons for the different behavior on floating of these two wood species are discussed briefly. 9 diagrams. E.S.

KIVELÄ, ARVO, and SAARELA, M. O. A surface-current producing apparatus for aiding river drives. Paper and Timber (Finland) [previously Finnish Paper Timber J.] 32, no. 2: 59-62 (February, 1950). [In Finnish]

The mode of operation of the apparatus is explained, supplemented by 12 figures. E.S.

WOOD WASTE

ENGLEBERT, RENNY. Salvaging sunken pulpwood. Can. Pulp Paper Ind. 3, no. 4: 28-9 (April, 1950); Paper Trade J. 130, no. 20: 36 (May 18, 1950).

Brief reference is made to the salvaging of sunken pulpwood on the West Coast in the booming grounds of the Crown Zellerbach Corp. at Port Angeles by a diver operating from a mobile hoisting barge and to the sounding and mining methods employed by the Quebec North Shore Paper Co. at Shelter Bay, Que., which recovered 850 cords from the bottom of the Rocky River last summer when the river was at its lowest level. It is estimated that 2.5% of the pulpwood is lost annually by sinkage during a river drive. E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patent themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Until the printing branch is in full operation and up to date, the printing of specifications will be several months behind.

ASPHALT

KILLINGSWORTH, ROBERT B., VAN HORN, HARRY T., and SPELSHOUSE, WALLACE E. Oxidized asphalt product and method of making same. U. S. patent 2,453,094. Filed Dec. 18, 1945. Issued Nov. 2, 1948. 2 claims. Assigned to Socony-Vacuum Oil Company. [Cl. 196-74]

A method is described for making an asphalt with a softening point-penetration temperature index of 0.0075 or less. Oil and wax are separated from a petroleum fraction containing microcrystalline wax to produce a crude petrolatum, which in turn is separated into microcrystalline wax and an oily fraction with a selective solvent for the oily fraction; the lower boiling fractions of the oily material are removed by distillation, and the distillation residue is blown with air to produce an asphaltic material with a softening point of 130 to 140. The product is suitable as a paper laminating agent when applied in thin films; the material remains flexible at temperatures as low as −10° F. E.G.S.

BARKERS AND BARKING

SWIFT, FRANK H. Hydraulic-barker nozzle assembly producing composite oscillatory movement of discharging jet. U. S. patent 2,502,763. Filed Oct. 3, 1946. Issued April 4, 1950. 5 claims. Assigned to Crown Zellerbach Corporation. [Cl. 144-208]

Means are provided for barking a log with a minimum number of hydraulic barking nozzles without rotation of the log; the assembly can be used for cants and slabs as well as whole logs. This is related to U. S. patent 2,448,041; *cf.* B.I.P.C. 20: 281-2. E.G.S.

BLEACHING

CEDERQUIST, KARL N. Method of bleaching cellulosic materials.

U. S. patent 2,502,410. Filed April 22, 1946. Issued April 4, 1950. 4 claims. Assigned to Mathieson Chemical Corporation. [Cl. 8-104]

This corresponds to Canadian patent 454,238; *cf.* B.I.P.C. 19: 442-3. E.G.S.

LEVY, ROBERT M., and BRENNAN, JAMES E. Catalytic bleaching with chlorites. U. S. reissue patent 23,218. Filed Feb. 13, 1950. Issued April 11, 1950. 7 claims. Assigned to Ecusta Paper Corporation. [Cl. 8-105]

This is a reissue of U. S. patent 2,477,631; *cf.* B.I.P.C. 20: 53. E.G.S.

BOARD, LAMINATED

PERRY, HENRY J. Method of making laminated fiberboard. U. S. patent 2,503,407. Filed April 19, 1945. Issued April 11, 1950. 6 claims. Assigned to The J. P. Lewis Co. [Cl. 154-132]

A method is described for the manufacture of a resin-impregnated, laminated fiberboard. The beater furnish includes 45% of steamed groundwood, 15% of kraft pulp, and 40% of extracted pinewood pitch (all on a dry weight basis). The total wood fiber content (steamed groundwood and kraft pulp) may vary from 50 to 75% of the mixture, and the pinewood pitch may vary correspondingly from 50 to 25%. About 1 to 3% of rosin size (based on the total dry wood fiber content) and 10 to 20% of a plasticizer (based on the dry resin content) are added to the fibrous mixture. Sufficient alum is added at the beater to give a pH of 4.0 to 5.0. E.G.S.

BOARD SPECIALTIES

ALTON, HOWARD W. Tumble display device. U. S. patent 2,502,693. Filed March 22, 1946. Issued April 4, 1950. 5 claims. [Cl. 211-133]

A cardboard tumble display device is adapted for placement on the open top of a standard-size case of merchandise (e.g., canned or bottled fruits or beverages); an additional quantity of the displayed merchandise may be piled in the device without rearranging the contents of the case. E.G.S.

CAHNERS, NORMAN L. Portable platform. U. S. patent 2,503,240. Filed March 11, 1946. Issued April 11, 1950. 3 claims. Assigned to Materials Handling Laboratories, Inc. [Cl. 248-120]

The platform of a double-faced corrugated pallet is supported by a number of spaced corrugated members, which are adhesively attached to the undersurface of the platform. The supporting members are arranged so that the forks of a lift truck can be inserted from any side of the pallet. E.G.S.

LEBOLD, SAMUEL N. Bottle carrier. U. S. patent 2,505,192. Filed May 20, 1948. Issued April 25, 1950. 3 claims. Assigned to Morris Paper Mills. [Cl. 224-45.1; changed to 224-45]

A paperboard bottle carrier is provided with a handle which can be depressed to an inoperative position for stacking the loaded carriers. E.G.S.

MCLOUGHLIN, GEORGE F., JR. Skirt support for corpses. U. S. patent 2,504,210. Filed Dec. 22, 1947. Issued April 18, 1950. 8 claims. [Cl. 223-66; changed to 223-68]

A paperboard skirt support is described; the folds of a skirt can be arranged over the support to lie smoothly and naturally. E.G.S.

PETERSEN, NELS H. Material packaging. Canadian patent 464,130. Filed March 17, 1949. Issued April 4, 1950. 14 claims. Assigned to Addison-Semmes Corporation.

This is the same as U. S. patent 2,476,623; *cf.* B.I.P.C. 19: 888. E.G.S.

PFEIL, ERNEST W. Hat holder. U. S. patent 2,503,840. Filed Nov. 19, 1948. Issued April 11, 1950. 4 claims. [Cl. 211-32]

A cardboard holder for a man's hat includes a face plate or panel and a front supporting frame or yoke which is swung outwardly from the face plate. E.G.S.

CELLULOSE

EDELSTEIN, SIDNEY M. Solubilized cellulose and method of making. Canadian patent 464,401. Filed Aug. 31, 1943. Issued April 18, 1950. 9 claims.

This is the same as U.S. patent 2,357,731, which was issued Sept. 5, 1944; it is related to U. S. patents 2,322,427 (issued June 22, 1943) and 2,419,341 (*cf.* B.I.P.C. 17: 598-9). A solution of cellulose is prepared from a slurry of cellulose, ice, and an aqueous solution of sodium zincate containing an excess of sodium hydroxide over the calculated amount that is necessary to form the zincate. Sufficient ice is used to cool the mixture to a temperature between the crystallization temperature of an inorganic component of the solution and about 5° C.; the ice serves to dilute the sodium zincate as the temperature falls, so that the cellulose is dissolved. E.G.S.

EDELSTEIN, SIDNEY M. Treatment of cellulosic pulp. Canadian patent 464,400. Filed March 2, 1943. Issued April 18, 1950. 7 claims.

A method for lowering the viscosity of cellulosic pulp comprises mixing a wood pulp (passes 60-mesh screen) and a dilute aqueous hydrogen peroxide solution at a pH of 6-8, and warming the mixture in contact with a metal (in elemental form) selected from the group consisting of iron, copper, aluminum, and manganese. This corresponds to U. S. patent 2,368,527, which was issued Jan. 30, 1945. E.G.S.

CHIPS

KYLANDER, KARL Y. Process in the manufacture of cellulose from wood chips. Canadian patent 464,588. Filed Nov. 26, 1945. Issued April 25, 1950. 9 claims.

In the preparation of pinewood chips for sulfite digestion, the chips are pretreated with sulfur dioxide gas or sulfurous acid and then impregnated with a solution of pyroligneous acid, methyl alcohol, and acetone. E.G.S.

COTTON LINTERS

EVANS, FOREST B. Production of cellulose. Canadian patent 464,667. Filed Sept. 20, 1944. Issued April 25, 1950. 14 claims. Assigned to Hercules Powder Company.

A process is described for the purification of cotton linters to produce a cellulosic material which is substantially free of palisade cells. Raw cotton

linters are digested in a 5-15% aqueous caustic soda solution for ten minutes to four hours at 260-390° F. under a pressure of 15-200 p.s.i. (gage), and subsequently bleached with a dilute aqueous hypochlorite solution. E.G.S.

DIELECTRICS

SPROULL, REAVIS C., and STAATS, PHILIP L. Glass fiber sheet material. U. S. patent 2,504,744. Filed June 3, 1944. Issued April 18, 1950. 1 claim. Assigned to General Electric Company. [Cl. 92-3]

A sheet material which is suitable for capacitor dielectric purposes consists of about 75% of uncoated glass fibers having a diameter of about 0.3 mil and a maximum average length of about 20 mils, and about 25% of kraft pulp fibers; the fibers are arranged in heterogeneous relation without major orientation. E.G.S.

DISPENSING CONTAINERS

VOMACKA, EDWARD E. Dispensing container. U. S. patent 2,505,697. Filed April 15, 1946. Issued April 25, 1950. 3 claims. [Cl. 222-361]

A cardboard dispensing container for soap flakes or granules incorporates means for dispensing a measured amount of the packaged material. E.G.S.

DYES AND DYEING

KILLIAN, DONALD B. Production of improved thioindigo pigments. U. S. patent 2,493,072. Filed March 7, 1947. Issued Jan. 3, 1950. 7 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-332]

A process is described for the preparation of 5,5′-dichloro-7,7′-dimethyl-2,2′-bisthionaphthenindigo; chlorosulfonic acid is reacted with 2-methyl-4-chlorophenylthioglycolic acid in the presence of a dimethylbenzenethiol. The product is suitable as a pigment for coloring paper, plastics, leather, textiles, and paints. E.G.S.

FOLDING BOXES

BUTTERY, KENNETH T. Collapsible covered container or box. Canadian patent 464,230. Filed May 13, 1948. Issued April 4, 1950. 7 claims. Assigned to Sutherland Paper Company.

A collapsible, covered paperboard container is described. E.G.S.

BUTTERY, KENNETH T. Covered container. U. S. patent 2,503,798. Filed April 16, 1947. Issued April 11, 1950. 7 claims. Assigned to Sutherland Paper Company. [Cl. 229-36]

A covered paperboard container incorporates a moisture-resistant liner which is adhesively attached to the rear wall of the carton. E.G.S.

BYRD, WALTER J. Carton. U. S. patent 2,502,417. Filed Jan. 28, 1947. Issued April 4, 1950. 4 claims. Assigned to Johnson & Johnson. [Cl. 206-59]

A dustproof carton is suitable for the packaging and dispensing of rolls of surgical gauze. E.G.S.

CHEMLINSKI, RAYMOND. Carton for ink bottles. U. S. patent 2,504,179. Filed June 3, 1948. Issued April 18, 1950. 4 claims. [Cl. 120-73]

A cardboard ink bottle carton is constructed so that it may be converted into an inkstand. E.G.S.

FETTINGER, JOHN G. Carton and display basket. U. S. patent 2,505,034. Filed March 26, 1947. Issued April 25, 1950. 5 claims. Assigned to Robert Gair Company, Inc. [Cl. 229-31]

The sides of an expansible paperboard carton can be pulled apart at the top when the cover is removed, thus forming a display basket. E.G.S.

LEVINE, HENRY. Collapsible egg carton. U. S. patent 2,503,343. Filed Aug. 18, 1945. Issued April 11, 1950. 1 claim. [Cl. 229-29]

A collapsible egg carton is constructed in accordance with U. S. patent 2,005,345, which was issued June 18, 1935, wherein a separate, readily insertable element is employed to interlock the transverse partition walls with the bottom wall of the carton; the transverse walls are thus maintained in parallel relation, and the bottom wall is supported against collapse. The present construction incorporates features which facilitate the manufacture and manual setting up of the carton, and which provide greater cushioning support for the eggs in the container. E.G.S.

RODRIGUEZ, MANUEL G. Sealing means for cartons. Canadian patent 464,123. Filed March 16, 1948. Issued April 4, 1950. 12 claims.

This is the same as U. S. patent 2,489,817; *cf.* B.I.P.C. 20: 365. E.G.S.

THOMAS, MANVILLE. Carton. U. S. patent 2,505,442. Filed Oct. 22, 1947. Issued April 25, 1950. 5 claims. Assigned to Marathon Corporation. [Cl. 229-33]

A collapsible cardboard container for frozen foods incorporates means for retaining and stiffening the receptacle in the setup position. E.G.S.

INSULATION AND INSULATING MATERIALS

PORTZ, FREDERICK G. Insulation composition. Canadian patent 464,599. Filed May 13, 1946. Issued April 25, 1950. 2 claims.

This is the same as U. S. patent 2,470,641; *cf.* B.I.P.C. 19: 741. E.G.S.

INTERIOR PACKING

BURSTINER, JACK. Method of wrapping or packaging confections. U. S. patent 2,505,384. Filed May 31, 1945. Issued April 25, 1950. 2 claims. [Cl. 99-180]

A paper base or sheet is provided which carries embossed, cuplike indentations for retaining individual pieces of candy; the indentations may be imprinted with colored identification marks. E.G.S.

LIGNIN

PIERCE, JOHN S. Lignin aliphatic acids and salts. U. S. patent 2,503,297. Filed Dec. 3, 1945. Issued April 11, 1950. 9 claims.

Assigned one half to The Albemarle Paper Manufacturing Company. [Cl. 260-124]

A process for converting alkali lignin into lignin acetic acid includes the step of reacting alkali lignin with chloroacetic acid and alkali in a highly polar solvent selected from the group consisting of water, methyl alcohol, ethyl alcohol, and aqueous solutions of methyl, ethyl, and isopropyl alcohol. The product is suitable for use as a water-soluble insecticide, fungicide, wood preservative, sizing agent, or organic intermediate. E.G.S.

SALVESEN, JÖRGEN R., and HARMON, CARLYLE. Lignin compounds and method for making same. U. S. patent 2,505,304. Filed June 19, 1947. Issued April 25, 1950. 4 claims. Assigned to Marathon Corporation. [Cl. 260-124]

A process is described for the production of a demethylated lignin compound by controlled alkaline hydrolysis. An aqueous mixture containing 250-350 g./l. of sodium lignosulfonate (substantially free from calcium and magnesium ions) and 50-100 g./l. of caustic soda is prepared; the mixture is heated under pressure at 265-325° C. for 30-120 minutes; the free excess caustic soda in the solution is neutralized until the resulting solution has a pH of 10.5. The mixture is dried in any suitable manner to provide a lignin product which will not tend to heat or ignite during storage under normal room conditions. In aqueous alkaline solution the product is an effective dispersing agent for clay and other inorganic suspensions. The material is suitable for boiler water treatment. It also presents a starting material for the preparation of pure organic degradation products from lignosulfonates. E.G.S.

MACHINERY—BOARD MACHINES

BREYFOGLE, ROY H. Cylinder paper making machine and method of making paper. Canadian patent 464,384. Filed Nov. 21, 1947. Issued April 11, 1950. 14 claims.

A method of making paper comprises the rotation of a cylinder mold in a pond of stock; the drainage of the white water from the stock into the cylinder mold to deposit and build up a fibrous web on the mold; the couching of the web from the mold; the admixture of controlled amounts of fresh stock with the white water; and the introduction of the fortified white water beneath the level of the pond at a selected point between the points where the mold enters and leaves the pond. E.G.S.

EDSTROM, JOHN. Method of making plates of definite thickness, preferably porous boards. Canadian patent 464,433. Filed Oct. 23, 1947. Issued April 18, 1950. 7 claims. Assigned to Aktiebolaget Svenska Fläktfabriken.

A method of making a porous board from a fibrous material comprises the steps of pouring a liquid suspension of fibers into a mold which has a perforated bottom plate; allowing the liquid to drain from the mold until a wet boardlike mass is formed; removing a portion of the top layer of the mass with a movable cutting member; and conveying the remainder of the boardlike material to a drier. E.G.S.

MACHINERY—CONVERTING MACHINERY

BENOIT, LEON, and VAHLE, RAYMOND. Carton erecting machine. U. S. patent 2,505,703. Filed Dec. 5, 1945. Issued April 25, 1950.

11 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-37]

A machine is provided for erecting a cellular carton for eggs, fruits, candies, and the like from a pair of blanks, each of which has a row of flaps which are turned to form crosswalls; means are included for engaging each crosswall with the sidewall of the opposite blank and resiliently locking it in place. E.G.S.

BERGSTEIN, SAMUEL. Mechanism and method for making boxes with attached handles and the like. Canadian patent 464,561. Filed April 8, 1946. Issued April 18, 1950. 39 claims.

A mechanism for attaching a pre-diecut handle to a box blank includes means for introducing an adhesive between a portion of the handle and a predetermined area of the blank. E.G.S.

BERNARD, WILLIAM, and BERNARD, JOSEPH. Apparatus for manufacturing cement-asbestos board. U. S. patent 2,503,466. Filed Oct. 21, 1947. Issued April 11, 1950. 7 claims. Assigned to American Asbestos Industries, Inc. [Cl. 92-43]

An apparatus is described for the manufacture of cement-asbestos board such as is used in the fabrication of cement-asbestos shingles. Single and laminated layers of cement-asbestos are treated so that within a minute after a layer has been picked up from the molding vat, it forms part of a laminated board dry enough to be handled. Sufficient water is removed from the board on the machine that oven drying is not required. E.G.S.

KIEVIT, JASPER. Machine for making roll dispensing containers. U. S. patent 2,504,698. Filed Sept. 28, 1948. Issued April 18, 1950. 7 claims. Assigned to The Crystal Waxing Company. [Cl. 1-2]

A machine is provided for rapidly fabricating tear-off knives and attaching them to the edges of roll-dispensing container blanks (e.g., for rolls of waxed paper). 25 drawings. E.G.S.

KIMBALL, BENJAMIN M. Apparatus for making paper cord. U. S. patent 2,505,050. Filed Sept. 7, 1948. Issued April 25, 1950. 6 claims. Assigned to The Cellucord Corporation. [Cl. 57-35]

An apparatus for the manufacture of paper cord incorporates means for twisting and winding the cord in a single operation, thus rendering it feasible to produce long lengths of cord which are free from knots. E.G.S.

NEWELL, EDWARD. Envelope machine. Canadian patent 464,596. Filed March 18, 1948. Issued April 25, 1950. 4 claims.

A machine is designed for the formation of flapped envelope blanks from a continuous web of paper; means are included for gumming the exposed surface of the closure flaps as the envelopes are discharged from the machine. E.G.S.

VAN ANTWERPEN, MARTIN. Machine for fabricating a cushioning packaging strip. U. S. patent 2,504,473. Filed March 24, 1947. Issued April 18, 1950. 16 claims. [Cl. 154-32]

A machine and process are described for the fabrication of cushioning and shock-absorbing strips for frangible articles, such as the glass replacement parts for automobiles. 39 figures. E.G.S.

MACHINERY—CONVEYORS

ROLL, CARLTON W. Oven with paper conveyor. U. S. patent 2,503,771. Filed Dec. 29, 1944. Issued April 11, 1950. 2 claims. Assigned one half to Robert G. White. [Cl. 107-56]

A bakery oven is provided with a continuous paper strip conveyor in place of the conventional metal conveyor. It is claimed that the use of the paper strip permits the baking process to begin at a point near the mouth of the oven, since it is unnecessary to expend a large amount of heat in warming the conveyor. E.G.S.

MACHINERY—CORRUGATING MACHINE

JACOBSEN, PETER. Machine for corrugating cardboard. U. S. patent 2,505,404. Filed March 21, 1947. Issued April 25, 1950. 12 claims. Assigned to Dry Corrugating Method v/Akselbo, Berbom og Drostholm. [Cl. 154-31]

A machine for producing corrugated cardboard comprises two toothed co-operating rollers, the diameters of which are so adapted that not more than three teeth on one roller are engaged with the teeth on the other roller at any one time. E.G.S.

MACHINERY—CUTTERS

HEYMAN, ALBERT A. Straw cutting mechanism for straw manufacturing machines. Canadian patent 464,731. Filed July 24, 1948. Issued April 25, 1950. 3 claims. Assigned to Joseph Shapiro.

A machine for the manufacture of drinking straws incorporates means for changing the timing cycle of a cutting blade in order to sever longer or shorter sections from a continuous length of spirally wound tube. E.G.S.

MACHINERY—DECORTICATING MACHINE

REEVES, JOHN S. Decorticating machine. Canadian patent 464,122. Filed March 20, 1947. Issued April 4, 1950. 10 claims.

This is the same as U. S. patent 2,490,157; *cf.* B.I.P.C. 20: 368. E.G.S.

MACHINERY—DRYERS

OFFEN, BERNARD. Apparatus for drying webs. Canadian patent 464,422. Filed May 30, 1947. Issued April 18, 1950. 17 claims.

An apparatus for drying webs incorporates primary and secondary drying stages; a number of moving open-flame burners are directed in the line of travel of the web in the primary stage; heated air is supplied to the surface of the web in the secondary stage. Means are included in the primary stage for the delivery of relatively cold air to the web whenever its travel is interrupted. E.G.S.

MACHINERY—FELT CONDITIONERS

PREVOST, BRUNO E. Continuous paper mill felt cleaner. Canadian patent 464,147. Filed May 15, 1947. Issued April 4, 1950. 1 claim. Assigned to John W. Bolton & Sons, Inc.

A shower pipe containing spray nozzles is positioned to spray hot water onto the surface of a papermaking felt as it passes over a suction box. E.G.S.

MACHINERY—FELTS

BERGLUND, ORION W. Treatment of felts for paper making machinery and the like. Canadian patent 464,339. Filed Nov. 19, 1947. Issued April 11, 1950. 6 claims. Assigned to The Orr Felt & Blanket Company.

A method of increasing the service life of papermaking felts comprises the impregnation of the felt with a silicone-containing liquid, the removal of any silicone liquid which is in excess of an amount corresponding to a pickup of 10-25% of cured resin, and the drying of the impregnated felts at 225-250° F. for about three hours. E.G.S.

MISCALL, DARWIN. Web carrier and method of making same. U. S. patent 2,503,629. Filed June 23, 1948. Issued April 11, 1950. 6 claims. Assigned to The Orr Felt and Blanket Company. [Cl. 28-74; changed to 28-72.3]

A papermaking felt is impregnated with an alkylated melamine-formaldehyde condensation product, and the resin is cured in the felt. It is claimed that this treatment enhances the chemical and abrasion resistance of the felt. E.G.S.

MACHINERY—GUIDE ROLLS

STAEGE, STEPHEN A. Paper machinery. Canadian patent 464,146. Filed Sept. 22, 1947. Issued April 4, 1950. 14 claims. Assigned to The Black-Clawson Company.

This is the same as U. S. patent 2,484,473; *cf.* B.I.P.C. 20: 217-18. E.G.S.

MACHINERY—HEAD BOX

HOLLIS, ROBERT F. Cylinder paper making machine. Canadian patent 464,269. Filed Nov. 5, 1947. Issued April 11, 1950. 7 claims.

The walls of the headbox of a cylinder machine define a venturi throat which serves to equalize the condition of the stock across the width of the machine. E.G.S.

HURTER, ALFRED T. Flow box and slice assembly for paper making machines. Canadian patent 464,219. Filed May 12, 1948. Issued April 4, 1950. 14 claims. Assigned to Stadler, Hurter & Company.

The flow box of a papermaking machine comprises a whirlpool compartment which is provided with rearwardly disposed, vertical upflow inlet passages through which stock is delivered under pressure to the compartment in a vertical direction perpendicular to the lowest point of the bottom wall of the compartment, and a forwardly inclined slice assembly through which the stock passes to the papermaking wire. E.G.S.

MACHINERY—PACKAGING MACHINERY

HARTMAN, CARL H., MARSH, ESLI A., and DORRINGTON, NEIL E. Apparatus for closing bags. Canadian patent 464,541. Filed March 6, 1946. Issued April 18, 1950. 10 claims. Assigned to St. Regis Paper Company.

An apparatus for feeding filled bags to a sewing machine incorporates belts for gripping the top of a bag; means are also included for pressing the bag walls inward and downward and for squaring the shoulders of the bag. E.G.S.

SALFISBERG, LEROY L. Alignment controlling packaging machine. U. S. patent 2,483,155. Filed Jan. 16, 1946. Issued Sept. 27, 1949. 7 claims. Assigned to Ivers-Lee Company. [Cl. 93-3]

A machine for packaging tablets, pellets, powders, and the like between continuous strips of cellophane includes means for periodically registering or compensating for the misregister of indicia-bearing zones with their respective compartments. E.G.S.

MACHINERY—REFINERS

LAVISTE, CORNELIUS. Means for defibrating and grinding paper pulp or other fibrous material. Canadian patent 464,271. Filed July 14, 1948. Issued April 11, 1950. 4 claims.

A conical refiner is equipped with a set of longitudinal defibrating and grinding knives mounted in a rotatable plug; the shell is fitted with similar knives which are arranged so that pulp may be fed to the refiner through the openings between the individual stationary knives. E.G.S.

MACHINERY—SCREENS

YOUNG, FRANK W., and FAHLGREN, SVEN A. Method of and apparatus for screening paper pulp. U. S. patent 2,505,513. Filed Feb. 1, 1944. Issued April 25, 1950. 3 claims. Assigned to Bird Machine Company. [Cl. 92-33]

It is an object of this invention to screen and knot the raw unwashed stock without producing foam. The knotter is operated so that air will not be mixed with the liquor flowing to and through the knotter. In order to achieve this result the stock is introduced into the liquor below the liquid level in the knotter box. E.G.S.

MACHINERY—SUCTION BOXES

CLARK, CARLETON L. Suction box. U. S. patent 2,503,436. Filed Sept. 21, 1945. Issued April 11, 1950. 2 claims. [Cl. 92-52]

This is similar to Canadian patent 450,742; *cf.* B.I.P.C. 19: 64. E.G.S.

PAPER—COATED

HOEHN, HARVEY H. Wax and polymeric polyketone compositions and articles coated therewith. U. S. patent 2,495,285. Filed March 25, 1949. Issued Jan. 24, 1950. 13 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-28.5]

A wax melt containing two parts of an ethylene-carbon monoxide polymeric polyketone, one part of polyisobutylene, and 17 parts of paraffin wax is coated on overprint label stock as a melt. The coating is glossy, flexible, does not strike through, and has fair heat sealability. E.G.S.

TREADWAY, ROBERT H. Esters of methacrylic acid. U. S. patent 2,492,203. Filed Jan. 15, 1946. Issued Dec. 27, 1949. 9 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 260-17.4]

The methacrylic esters of dextrin, maltose, and glucose are applied from solutions to produce coatings, finishes, and sizes for paper, cloth, wood, glass, metal, and other materials. E.G.S.

PAPER—COATED (HOT-MELT)

ZWEIG, SAMUEL. Plasticized composition of polyvinyl acetal. U. S. patent 2,492,512. Filed Jan. 26, 1946. Issued Dec. 27, 1949. 1 claim. Assigned to Milprint, Inc. [Cl. 260-23]

A thermoplastic coating composition for paper, metal foil, or regenerated cellulose comprises 5-30% by weight of polyvinyl butyral having an 8-15% hydroxy content, 25-85% of hydrogenated castor oil, and 2-25% of castor oil. E.G.S.

PAPER—COATED (ION-EXCHANGE)

ERICKSON, DONALD R. Coated paper and method of making same. U. S. patent 2,502,783. Filed Nov. 17, 1949. Issued April 4, 1950. 9 claims. [Cl. 117-62; changed to 117-157] *cf.* B.I.P.C. 19: 858.

A coated paper is produced which is particularly adapted for printing and which exhibits a high resistance to pick and rub. The specified coating composition is prepared in the following manner: 100 parts by weight of Georgia clay are dispersed in 100 parts of soft water containing 5% of sodium hydroxide; the resulting slurry is dispersed with six parts of water-insoluble hydroxyethylcellulose dissolved in 100 parts of a 5% aqueous sodium hydroxide solution. A viscous coating is formed which may be applied to a paper base with any suitable coating machine which will not be damaged by the sodium hydroxide. E.G.S.

ERICKSON, DONALD R. Method of coating paper. U. S. patent 2,502,782. Filed Nov. 17, 1949. Issued April 4, 1950. 2 claims. [Cl. 117-62; changed to 117-157]

A method is given for coating paper to impart grease, oil, and organic solvent resistance. The coating composition is prepared by dissolving a hydroxyalkylcellulose (e.g., hydroxyethylcellulose or hydroxypropylcellulose) in a sodium hydroxide solution to form a viscous material; the material may be applied to the paper by means of any suitable coating device, such as a tub, brush, or roll coater. E.G.S.

PAPER AS A TEXTILE MATERIAL

BROCKMAN, EDWARD J., and SCRUGGS, THOMAS M. Method of making paper yarn. Canadian patent 464,462. Filed March 10, 1947. Issued April 18, 1950. 6 claims. Assigned to Bemis Bro. Bag Company.

This is the same as U. S. patent 2,482,895; *cf.* B.I.P.C. 20: 144-5. E.G.S.

PAPER SIZING

POOR, EDWARD N., and LANDES, CHESTER G. Color stabilized rosin size. U. S. patent 2,502,883. Filed May 12, 1948. Issued April 4, 1950. 9 claims. Assigned to American Cyanamid Company. [Cl. 106-218]

A method of producing a light-colored rosin size of improved color stability comprises the saponification of a mixture of 85-99% by weight of pale rosin and 1-15% of wood rosin color bodies (previously heated together in an oxygen-free atmosphere at 250-325° C. for 1-3 hours) with about 9-16%

(based on the weight of the mixture) of sodium carbonate. It is claimed that paper sized with the material exhibits a reduced tendency to discolor or darken with aging or heating. E.G.S.

POOR, EDWARD N., and LANDES, CHESTER G. Color stabilized rosin size. U. S. patent 2,502,884. Filed May 12, 1948. Issued April 4, 1950. 5 claims. Assigned to American Cyanamid Company. [Cl. 106-218]

A rosin size of improved color stability is produced by preparing a mixture of 85-99% by weight of pale rosin and 1-15% by weight of tall oil pitch, heating the mixture in an oxygen-free atmosphere at about 300° C. for about two hours, and then saponifying the resulting rosin product with about 9-16% (based on the weight of the mixture) of sodium carbonate. E.G.S.

PAPER SPECIALTIES

BERRY, KENNETH L. Polytetrafluoroethylene dispersions. U. S. patent 2,484,483. Filed July 26, 1945. Issued Oct. 11, 1949. 9 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-32.8; changed to 260-31.8]

A dispersion of a tetrafluoroethylene-ethylene copolymer in any neutral ester (e.g., diisobutyl adipate) or ketone (e.g., isofenchone) boiling above 175° C., is recommended for the impregnation of paper, fabric, and other porous and semiporous materials. The product is adapted for use as a coating and impregnating agent where resistance to heat, chemicals, and electrical stresses is desired. E.G.S.

CHOUINARD, ALFRED. Apron for haircut. Canadian patent 464,108. Filed March 25, 1948. Issued April 4, 1950. 1 claim. [In French]

A haircut apron consists of a square sheet of paper with a head opening in the center; the sheet is pleated in such a manner that it will drape over the upper half of the body. E.G.S.

HAMILTON, KENNETH C. Sputum cup. U. S. patent 2,503,045. Filed Oct. 31, 1946. Issued April 4, 1950. 2 claims. Assigned to Milwaukee Lace Paper Company. [Cl. 4-267]

A paper sputum cup is formed to receive a frusto-conical hollow member which functions as a baffle and partial closure for the open end of the receptacle. E.G.S.

HARRISON, WARD D., and MATTHEWS, ROBINSON E. Cigarette paper. U. S. patent 2,503,267. Filed Sept. 16, 1944. Issued April 11, 1950. 2 claims. Assigned to Ecusta Paper Corporation. [Cl. 92-3]

A combustible, nonwaterproofed, highly water-absorbent cigarette paper has a pH of about 8.5, and contains about 20-30% of calcium carbonate (based on the weight of the filled paper) and 0.025-0.10% of polymerized urea-formaldehyde resin. An increase of 50-100% in wet strength is realized. E.G.S.

HORWITT, NATHAN G. Printed picture mat sheet. U. S. patent 2,504,332. Filed July 2, 1948. Issued April 18, 1950. 5 claims. [Cl. 40-158; changed to 40-159]

A prefabricated mat sheet is readily formed into a mat having a number of different sized openings, within a relatively wide range of the most frequently used picture sizes. The mat sheet is preferably thinner than the usual paper picture mat; an opaque, uncoated book-paper stock (120-lb. basis weight) is desirable. E.G.S.

IRMSCHER, HANS O. Infusion package. Canadian patent 464,681. Filed Feb. 25, 1947. Issued April 25, 1950. 9 claims. Assigned to National Urn Bag Co., Inc.

This corresponds to U. S. patent 2,490,057; *cf.* B.I.P.C. 20: 372-3. E.G.S.

IVES, CHARLES Q. Flexible corrugated sheet material, method and apparatus. U. S. patent 2,503,874. Filed Feb. 27, 1946. Issued April 11, 1950. 22 claims. [Cl. 154-33.05; changed to 154-30]

The flexible material of this invention departs in structure from conventional corrugated paper and previous flexible corrugated paper in that the corrugations or flutes are interrupted or terminated at spaced intervals, with the top and side walls of the flutes terminating in the direction of the crest lines at cut edges; the flutes are cut so as to form transecting voids between the cut edges of the adjacent truncated flute sections. It is claimed that, despite the presence of these voids, the finished article possesses the benefits derived from the normal flute shape, including good shock resistance. E.G.S.

LOWER, DONALD E. Garment bag. U. S. patent 2,502,732. Filed May 27, 1946. Issued April 4, 1950. 1 claim. Assigned one half to Harry W. Lower. [Cl. 206-7]

A paper garment bag includes means for securing an intermediate portion of the bag to its upper end, so that the bag and enclosed garment can be folded into a compact package and readily carried. E.G.S.

NEWMAN, DOUGLAS A. Manifolding sheet material. U. S. patent 2,503,680. Filed April 5, 1946. Issued April 11, 1950. 11 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc. [Cl. 282-19]

Transfer-coated or carbonized paper strips or sheets are provided with a transfer coating of the usual thickness (0.0001-0.0002 inch) over the major portion of one surface; a marginal portion is free from such coating; a normally inactive adhesive is applied to both sides of the uncoated margin, in such a manner that the strip can be formed into a roll of substantial thickness and diameter without building up at one end, so as to cause the strip to break. E.G.S.

NEWMAN, DOUGLAS A. Transfer ribbon manufacture. U. S. patent 2,503,681. Filed March 26, 1946. Issued April 11, 1950. 12 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc. [Cl. 197-172]

A paper-base typewriter ribbon is coated with a normally solid wax-containing transfer composition; the raw edges of the paper surface and coating are consolidated so that the edges are free of projecting paper fibers, slittings, and loose flakes of transfer composition. E.G.S.

OTTERSON, OSCAR L. Three-in-one greeting card. U. S. patent

2,504,277. Filed Feb. 27, 1948. Issued April 18, 1950. 3 claims. [Cl. 40-152.1]

A multipurpose foldable greeting card is provided with an insertible card on one part of the folio on which a greeting may be placed; a second insertible card bears a picture or the like; a calendar is attached to the face of the card. E.G.S.

PATE, CHARLES A. Envelope for filing purposes and the like. U. S. patent 2,503,592. Filed Nov. 16, 1945. Issued April 11, 1950. 4 claims. [Cl. 129-20]

A manila paper envelope is provided with a pocketlike extension which is adapted for attachment in a file such as a legal file. E.G.S.

PETERSON, WILLARD D. Photographic diazotype material particularly suitable for preparing intermediate prints. Canadian patent 464,657. Filed April 25, 1947. Issued April 25, 1950. 6 claims. Assigned to General Aniline & Film Corporation.

A transparent diazotype material which is suitable for the production of transition and intermediate prints comprises a glassine-paper base coated on both sides with a sensitizing composition containing a low-viscosity cellulose acetate, *p*-diethylaminobenzene diazonium borofluoride, and resorcinol. E.G.S.

PICKENS, JOHN D. Polyamide cold bonded laminate. U. S. patent 2,502,340. Filed April 6, 1944. Issued March 28, 1950. 6 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 154-138; changed to 154-133]

Paper, regenerated cellulose, or a fabric is coated or impregnated with a solution of *N*-alkoxymethyl polyamide, the solvent is evaporated, and the treated sheet is used in the same manner as a film of the polymer. The paper or fabric may be coated or impregnated with the adhesive solution containing the catalyst, or the catalyst can be applied by spraying. E.G.S.

REID, MARSHALL B. Composite paper roll. U. S. patent 2,502,749. Filed Feb. 1, 1947. Issued April 4, 1950. 7 claims. Assigned to Brooks Paper Company. [Cl. 206-59]

A composite wrapping material for frozen-food packaging consists of a double-ply structure; the outer web or sheet is a heavy paper coated with a thin layer of wax, and the inner web is constructed of moisture-resistant cellophane, Pliofilm, or the like. E.G.S.

ROPER, AMUND S. Duplex bag body. U. S. patent 2,502,481. Filed Dec. 7, 1946. Issued April 4, 1950. 1 claim. Assigned to Bemis Bro. Bag Company. [Cl. 229-55]

A duplex bag for food packaging comprises an inner paper ply and an outer cellophane ply; the inner ply has a window opening in one or more of its walls, and the outer ply is secured to the inner ply around the window. It is claimed that this construction prevents the leakage of the packaged contents into the space between the plies. E.G.S.

SHEARER, DAVID McD. Method of molding concrete revetment mat units. U. S. patent 2,505,152. Filed Feb. 11, 1949. Issued April 25, 1950. 4 claims. [Cl. 25-154]

A method of molding unit sections of concrete revetment mats consists in first casting a unit section in a mold flask; disengaging the flask from the casting after it has become set; placing a sheet of paper over the casting; remounting the nowel of the mold flask in assembled form on the precasting; placing a second sheet of paper over the first sheet and nowel crosspieces; placing a cope on the nowel; and filling the flask with concrete. E.G.S.

PLASTICS—FILLERS

WILLIAMSON, ROBERT V., and CLARK, THOMAS F. Lignocellulose, phenol formaldehyde, and inorganic filler molding composition. U. S. patent 2,502,498. Filed Oct. 18, 1946. Issued April 4, 1950. 7 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 260-17.2]

A thermosetting molding composition comprises about 50% lignocellulose (e.g., hemp hurd, corncob, wheat straw, or flax-shive flour), 25% phenol-formaldehyde resin, and 22.5-25% precipitated chalk. E.G.S.

PLASTICS—PAPER-BASE

CALDWELL, WILLIAM E., JR. Refrigerator breaker frame. U. S. patent 2,504,390. Filed July 13, 1945. Issued April 18, 1950. 2 claims. Assigned to St. Regis Paper Company. [Cl. 20-74]

Unitary, built-up, framelike structures of a laminated plastic material are employed as door frames or so-called "breaker frames" on refrigerators to minimize heat transfer between the outer shell and the inner tank of the refrigerator cabinet. The laminate consists of a sheetlike base material (e.g., paper, glass or asbestos mat, cloth, etc.) which is impregnated with a thermosetting synthetic resin varnish (e.g., a varnish made from any of the straight phenol-aldehyde resins or their modifications). E.G.S.

MUSKAT, IRVING E. Method of molding. U. S. patent 2,495,640. Filed June 8, 1945. Issued Jan. 24, 1950. 17 claims. Assigned to Marco Chemicals, Inc. [Cl. 154-110]

A method is described for molding laminated resin sheets or parts at low pressure. A sheet of fibrous material (e.g., paper, fabric, or felted glass fiber) is placed across the mouth of a female mold, an unsaturated polymerizable resinous material is poured over the sheet, and a complementary male mold is used to force the sheet and resin into the female mold. The materials are cured under heat and pressure. E.G.S.

ROOFING FELTS

QUINN, ROBERT G. Roofing felt. U. S. patent 2,503,454. Filed Dec. 9, 1944. Issued April 11, 1950. 2 claims. Assigned to Johns-Manville Corporation. [Cl. 92-3]

This corresponds to Canadian patent 455,029; *cf.* B.I.P.C. 19: 604. E.G.S.

SETUP BOXES

DAVIS, STANLEY H. Article holding and display container. U. S. patent 2,503,379. Filed July 2, 1949. Issued April 11, 1950. 2 claims. Assigned to The S. H. Davis Paper Box Company. [Cl. 229-20]

A paperboard container for holding crayons and color card sets incorporates a cover which telescopes over the body of the carton and which may be swung laterally on its hinge to expose the open end of the box. E.G.S.

SHIPPING CONTAINERS

EBERT, LUDWIG. Package device for shipping and displaying articles, and display mantle therefor. U. S. patent 2,502,561. Filed Feb. 25, 1947. Issued April 4, 1950. 3 claims. Assigned to Einson-Freeman Co., Inc. [Cl. 206-44]

A corrugated shipping carton for bottled goods (e.g., wine) is provided with special markings or indicia which facilitate the slitting of three sides of the box to form an open-top display structure. E.G.S.

HILTON, GROVER C. Combined bottle shipping and display device. U. S. patent 2,505,399. Filed Feb. 24, 1948. Issued April 25, 1950. 2 claims. [Cl. 206-45.14]

A cardboard shipping and display device for bottles of liquid cement incorporates two advertising panels which afford protection for the bottles during shipment. E.G.S.

OTTINGER, AUGUST F. Method of packaging lumped commodities. U. S. patent 2,502,586. Filed June 15, 1944. Issued April 4, 1950. 1 claim. Assigned to Bemis Bro. Bag Company. [Cl. 226-51; changed to 226-54]

A method is described for the construction of a semirigid package for fruit, vegetables, and materials of similar lump form; the package consists of a cylindrical corrugated liner which is enclosed in an open-mesh bag. E.G.S.

SULFITE WASTE LIQUOR

GRAENACHER, CHARLES, and MATTER, MAX. Pest-combating compositions and spraying liquids of enhanced adhering capacity. U. S. patent 2,490,958. Filed May 7, 1946. Issued Dec. 13, 1949. 8 claims. Assigned to Ciba Limited. [Cl. 167-42; changed to 167-29]

Five parts of ammonium sulfate are mixed with seven parts of sulfite waste liquor powder to form a homogeneous mixture, which is then finely ground. The resulting powder is mixed with 84 parts of cupric oxychloride and four parts of kaolin, and very finely ground. Twenty parts of the resultant fine green powder are dispersed in 1000 parts of water, with the addition of 1.7 parts of dimethylolurea (m.p. 110-114° C.). A spraying liquid is obtained which is suitable for the treatment of fruit trees before bud swelling to protect the trees against fungus pests. E.G.S.

TANBERG, RAGNAR. Method of manufacturing continuous electrodes. U. S. patent 2,495,148. Filed July 17, 1946. Issued Jan. 17, 1950. 3 claims. [Cl. 13-18]

A process is described for the formation of continuous electrodes for electric furnaces from a mixture of crushed anthracite coal or coke and evaporated sulfite waste liquor (50-60% dry solids) as the binding agent; the latter constitutes 10-35% of the total electrode composition. E.G.S.

TALL OIL

GAYER, FREDERICK H. Recovery of abietic acid. U. S. patent 2,493,866. Filed May 3, 1947. Issued Jan. 10, 1950. 23 claims. Assigned to Continental Research Corp. [Cl. 260-97.5; changed to 260-97.6]

A process is described for the separation and recovery of crystalline abietic acid from mixed resin acid material of the group consisting of rosin, isomerized rosin, tall oil resin acids, and their mixtures. The resin acid material is neutralized with ammonia in the presence of water; the resulting solution contains 10-200 parts of water to one part of initial material. The solution is heated to volatilize the ammonia, thus forming an aqueous dispersion with a pH less than 8. Abietic acid is crystallized from the dispersion on standing at 35-100° C. E.G.S.

GAYER, FREDERICK H. Recovery of abietic acid in the form of its quarter salt. U. S. patent 2,493,867. Filed May 3, 1947. Issued Jan. 10, 1950. 21 claims. Assigned to Continental Research Corp. [Cl. 260-97.5; changed to 260-97.6]

A crude tall oil is distilled rapidly at a pressure of 13 mm. of mercury until the distillate constitutes 55% by weight of the charge. The still residue has an acid number of 129 and the following composition: 50.6% resin acids, 22.1% fatty acids, and 27.3% unsaponifiable material. Ten grams of the still residue are completely neutralized with sodium hydroxide, the soap is stirred into 300 ml. of boiling water, and sulfuric acid is added to decompose 65% of the resin acid soap. The resulting dispersion is allowed to stand for several hours. A yield of 2.9 grams of the quarter salt (acid number 131) of abietic acid is obtained. E.G.S.

RUST, JOHN B. Tall oil esters and process of making them. U. S. patent 2,503,772. Filed Oct. 26, 1946. Issued April 11, 1950. 7 claims. Assigned one half to Montclair Research Corporation and one half to Ellis-Foster Company. [Cl. 260-22]

A process is described for making a tall oil ester which has improved air-drying characteristics and which is suitable for use in decorative and protective coatings. Tall oil and a polyhydric alcohol containing more than two hydroxyl groups (e.g., glycerol) are heated at 180-300° C. to form a hydroxyl-containing ester; a dicarboxylic acid monoester of a beta-unsaturated monohydric alcohol having from three to four carbon atoms (e.g., monoallyl maleate or monoallyl phthalate) and an acid esterification catalyst (e.g., *p*-toluenesulfonic acid) are added to esterify the hydroxyl-containing ester; the mixture is heated at 100-200° C. until an ester of low acid number is obtained. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

NORDLANDER, BIRGER W., and CASS, WILLIAM E. Resinous composition. Canadian patent 464,152. Filed June 18, 1946. Issued April 4, 1950. 6 claims. Assigned to Canadian General Electric Company, Limited.

A permanently fusible, wax-compatible, flame-resistant, resinous composition contains 30-40% of chlorine; the composition is the product obtained from the simultaneous combination of ethylene glycol, tetrachlorophthalic acid, and stearic acid. E.G.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

BOOR, LADISLAV, and FLUCK, LINTON A. Crease resistance testing. Canadian patent 464,287. Filed Nov. 10, 1945. Issued April 11, 1950. 3 claims. Assigned to American Cyanamid Company.

This is the same as U. S. patent 2,479,303; *cf.* B.I.P.C. 20: 63-4. E.G.S.

WET STRENGTH

FOX, ARTHUR L., SANDERS, HERBERT L., and OLSEN, ROBERT T. Thermosetting polyarylbiguanide-formaldehyde resins. U. S. patent 2,492,855. Filed Nov. 8, 1946. Issued Dec. 27, 1949. 6 claims. Assigned to General Aniline & Film Corporation. [Cl. 260-45.2]

It is claimed that the application of a 2% aqueous solution of a thermosetting polyarylbiguanide-formaldehyde resin will increase the wet strength of a paper sheet fivefold or more. E.G.S.

WOOD OPERATIONS

ALLIN, GEORGE S. Logging arch. U. S. patent 2,504,954. Filed Dec. 22, 1947. Issued April 25, 1950. 2 claims. Assigned to Isaacson Iron Works. [Cl. 214-65.3]

A logging arch is supported at opposite ends by large wheels, which are arranged in tandem and equipped with pneumatic tires, instead of being supported by the usual crawler tracks. E.G.S.

WOOD TRANSPORTATION

O'HALLORAN, JAMES. Water transportation of wood. U. S. patent 2,503,210. Filed Feb. 10, 1947. Issued April 4, 1950. 1 claim. Assigned to Anglo-Canadian Pulp and Paper Mills Limited. [Cl. 214-14; changed to 214-152]

A method of loading wood onto ships comprises the steps of admitting water to the ship's hold to provide a cushioning layer in the bottom of the hold; discharging the wood into the hold under water pressure to form a layer of wood covering the bottom of the hold; pumping the cushioning layer of water out of the hold; discharging more wood into the hold under water pressure; directing pressurized streams of water against the wood to position it in the hold; and pumping out the accumulated water. A method of unloading is also described. E.G.S.

WOOD WASTE

FARBER, EDUARD. Process for precipitating silver from solutions. U. S. patent 2,503,104. Filed May 13, 1946. Issued April 4, 1950. 6 claims. Assigned to Timber Engineering Company. [Cl. 75-108]

Silver is recovered from dilute solutions of its complex salts by the addition of a precipitant to the solutions. The precipitating agent is prepared by subjecting comminuted wood to the action of a dilute mineral acid under the proper conditions to hydrolyze the hemicelluloses. E.G.S.

AUTHOR INDEX TO BOOKS

Baker, W. J. 623
Black, L. J. 623
Brownlee, K. A. 624
Chapman, H. H. 624
Craighead, F. C. 623
Faraday Society 623
Fishenden, R. B. 624
Great Britain. *Department of Scientific and Industrial Research. Water Pollution Research Board* 624
Guthrie, J. E. 624
Harrar, E. S. 623
Lithographic Technical Foundation, Inc. 623
Matthews, A. F., ed. 624
Meyer, W. H. 624
The National Association of Paper Merchants 624
Panshin, A. J. 623
Perry, J. H., comp 623
Proctor, P. B. 623
Reinig, A., ed. 624
Robertson, B. L. 623
Robinson, K. D., comp. 623
Smith, G. F. 623
Société de chimie physique 623
Society of Industrial Packaging and Materials Handling Engineers ... 624
Standard Oil Company of New Jersey 624
U. S. Bureau of Mines 624
U. S. Dept. of Agriculture 623
Wayne University. School of Business Administration 624
Weissberger, A., ed. 623
Wyckoff, R. W. G. 623

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Addison-Semmes Corporation .....P 679
Aeby, A. 634
Akselbo, Berbom og Drostholm .....P 684
Aktiebolaget Svenska Fläktfabriken P 682
The Albemarle Paper Manufacturing Company .....P 682
Allgemeine Papier-Rundschau 672
Allin, G. S. .....P 694
Alton, H. W. .....P 678
American Asbestos Industries, Inc. .P 683
American Cyanamid Company ....P 687, P 688, P 694
American Paper and Pulp Association 651
Anglo-Canadian Pulp and Paper Mills Limited .....P 694
Aries, R. S. 651
Arneson, L. E. 648
Aronovsky, S. I. 641
Association of American Railroads. *Freight Loading and Container Section* 643
Aulin-Erdtman, G. 643
Bade, O. M. 641
Badger, R. M. 634
Baker, R. E. 668
Balster 654
Baser, N. 640
Bell, A. 642
Bemis Bro. Bag Company ....P 687, P 690 P 692
Benoit, L. .....P 682
Berglund, O. W. .....P 685
Bergstein, S. .....P 683
Bernard, J. .....P 683
Bernard, W. .....P 683
Berry, K. L. .....P 688
Beyer, D. L. 671
Bezner, O. 637, 638
Bird Machine Company .....P 686
The Black-Clawson Company .....P 685
Blakemore, F. T. 646
Bolton, J. W., & Sons, Inc. .....P 684
Boor, L. .....P 694
Brennan, J. E. .....P 678
Brewer, A. F. 643
Breyfogle, R. H. .....P 682
Brockman, E. J. .....P 687
Brooks, M. C. 634
Brooks Paper Company .....P 690
Brown, G. I. 663
Burgess, L. M. 650
Burstiner, J. .....P 681
Butterworth, J. A. 660
Buttery, K. T. .....P 680
Byrd, W. J. .....P 680
Cahners, N. L. .....P 678
Caldwell, W. E., Jr. .....P 691
Callin, G. 676
Canadian General Electric Company, Limited .....P 693
Carruthers, G. 629
Cass, W. E. .....P 693
Cederquist, K. N. .....P 677
The Cellucord Corporation .....P 683
Central Laboratory of the Cellulose Industry. *Analysis Committee* .. 634
Chandler, J. B. 642
Chatwin, M. A. 647
Chemlinski, R. .....P 681
Chouinard, A. .....P 688
Ciba Limited .....P 692
Clark, C. L. .....P 686
Clark, J. d'A. 658
Clark, T. F. .....P 691
Collins, T. T., Jr. 642
Columbia Ribbon and Carbon Manufacturing Company, Inc. .....P 689
Compton, G. C. 660
Continental Research Corp. .....P 693
Crawford, E. A. 658
Creamer, G. B. 675
Crown Zellerbach Corporation .....P 677
The Crystal Waxing Company .....P 683
Dana, H. J. 654
Darby, F. F., Jr. 633
Däubner-Rettenbacher, H. 643
Davidson, H. R. 636
Davies, C. N. 655
Davis, F. V. 671
Davis, S. H. .....P 691
Davis, The S. H., Paper Box Company .....P 691
Day, F. T. 655
Dean, D. K. 672
Delcroix, P. 654
Dobberstein, O. 637, 638
Dorrington, N. E. .....P 685
Draper, A. J. M. 661
Drissler, H. 655
Dry Corrugating Method .....P 684
du Pont de Nemours, E. I., & Company .....P 680, P 686, P 688, P 690
Dvonch, W. 666
Eberhardt, L. E. 646
Ebert, L. .....P 692
Ecusta Paper Corporation ....P 678, P 688
Edelstein, S. M. .....P 679
Edstrom, J. .....P 682
Einson-Freeman Co., Inc. .....P 692

Ellis-Foster Company ..... P 693
Engineering Products Company 647
Englebert, R. 676
Enkvist, T. 644
Enright, D. P. 670
Erickson, D. R. ..... P 687
Ernst, A. J. 641
Evans, F. B. ..... P 679
Evans, J. C. W. 667
Fachkunde-Kartei 642, 655, 673
Fahlgren, S. A. ..... P 686
Farber, E. ..... P 694
Ferriggi, J. J. 663
Fettinger, J. G. ..... P 681
Fibre Containers 631
Findlay, J. 671
Fluck, L. A. ..... P 694
Food Industries 648
Foster Wheeler Corporation 672
Fox, A. L. ..... P 694
Gabriel, A. E. 625
Gair, Robert, Company, Inc. P 681, P 683
Gayer, F. H. ..... P 693
Geiger, D. W. 676
Gekeler, M. 627
General American Transportation Corporation 637
General Aniline & Film Corporation ..... P 690, P 694
General Electric Company ..... P 680
Gibbs, R. 643
Godlove, I. H. 657
Goldthwait, C. F. 665
Gottschall, E. M. 660
Graenacher, C. ..... P 692
Grant, J. 653
Green, A. L. 664
Gruner, E. 629
Gundersen, F. H. 644
Hamilton, K. C. ..... P 688
Harmon, C. ..... P 682
Harrison. W. D. ..... P 688
Hartman. C. H. ..... P 685
Hatfield, A. L. 649
Heim, F. 648
Hercules Powder Company ..... P 679
Hermans, P. H. 647
Heyman, A. A. ..... P 684
Higginbotham, R. S. 666
Hill, L. E. 628
Hilton, G. C. ..... P 692
Hock, C. W. 632
Hoehn, H. H. ..... P 686
Hoffman, A. W. 663
Hollis, R. F. ..... P 685
Holte, T. 641
Hood, N. 626
Horwitt, N. G. ..... P 688
Hosie, R. C. 640
Hubbard, J. K. 627, 628
Humphrey, J. D. 628
Hungate, R. E. 626
Hurter, A. T. ..... P 685
Ingram, H. 660
Irmscher, H. O. ..... P 689
Isaacson Iron Works ..... P 694
Ivers-Lee Company ..... P 686
Ives, C. Q. ..... P 689
J. C. B. 636
Jacobsen, P. ..... P 684
Jensen, W. 675
Johndrew, O. F., Jr. 663
Johns-Manville Corporation ..... P 691
Johnson & Johnson ..... P 680
Kahila, S. 644
Kasbekar, G. S. 670
Kendall, L. E. 641
Key, G. E. 671
Kiefer, H. J. 628
Kievit, J. ..... P 683
Killian, D. B. ..... P 680
Killingsworth, R. B. ..... P 677
Kimball, B. M. ..... P 683
King, C. J. 649
Kivelä, A. 676
Kleinert, T. 632
Kollmann, F. 626
Kominek, E. G. 674
Korn, R. 673
Kotte, H. 630, 673
Kuenzi, E. W. 659
Kurth, E. F. 627, 628, 674
Kylander, K. Y. ..... P 679
Lahey, R. W. 645
Landes, C. G. ..... P 687, P 688
Lauer, K. 637, 638
Laurola, O. 652
Laviste, C. ..... P 686
Lebold, S. N. ..... P 678
Levine, H. ..... P 681
Levy, R. M. ..... P 678
Lewis, H. F. 628
Lewis, The J. P. Co. ..... P 678
Libby, C. E. 635
Lipsmeyer, L. H. 662
Little, A. D., Inc. 656
Lord, H. 647
Lower, D. E. ..... P 689
Lower, H. W. ..... P 689
Lurie, R. 659
McBee, R. H. 627
McLoughlin, G. F., Jr. ..... P 678
McNeer, R. D. 635
Malm, C. J. 634
Mansch, W. 638
Marathon Corporation ..... P 681, P 682
Marco Chemicals, Inc. ..... P 691
Mark, H. 671
Marquardt, O. F. 660
Marsh, E. A. ..... P 685
Mason, S. G. 639
Materials Handling Laboratories, Inc. ..... P 678
Mathieson Chemical Corporation ... P 678
Matter, M. ..... P 692
Matthews, R. E. ..... P 688
Maxwell, C. S. 674
Merrill, R. C. 665
Meske, B. 638
Meyer, K. H. 633
Mhatre, S. H. 638
Milprint, Inc. ..... P 687
Milwaukee Lace Paper Company .. P 688
Minneapolis-Honeywell Regulator Company. *Brown Instrument Division* 647, 658
Miscall, D. ..... P 685
Modern Packaging 656
Montclair Research Corporation ... P 693
Moore, W. C. 636
Morris, C. V. 660
Morris Paper Mills ..... P 678
Mössmer, V. 632
Moyer, A. E. 659
Murdock, H. R. 648
Muskat, I. E. ..... P 691
National Urn Bag Co., Inc. ..... P 689
Nesbitt, W. P. 646
Neubrech, W. L. 652
New Era Manufacturing Company 646
Newell, E. ..... P 683
Newman, D. A. ..... P 689

Ninth Graphic Arts Production Yearbook 660
Nordlander, B. W. .....P 693
Offen, B. .....P 684
O'Halloran, J. .....P 694
Olsen, R. T. .....P 694
O'Neil, F. W. 635
Opderbeck, F. 634
The Orr Felt & Blanket Company P 685
Otterson, O. L. .....P 689
Ottinger, A. F. .....P 692
Overton, G. B. 660
Paisley Products Incorporated 639
Paper Industry 668
Paper Sales 662
Partridge, H. W. 671
Pate, C. A. .....P 690
Pearl, I. A. 671
Pearson, N. L. 637
Pennell, M. S. 667
Perry, H. J. .....652, P 670, P 678
Petersen, N. H. .....P 679
Peterson, W. D. .....P 690
Pfeil, E. W. ..... P 679
Philpot, J. C. 664
Pickens, J. D. .....P 690
Pierce, J. S. .....P 681
Plyler, E. K. 625
Poor, E. N. .....P 687, P 688
Portz, F. G. .....P 681
PP. 630, 662
"Practico" 645
Preston, J. M. 638
Prevost, B. E. .....P 684
Pulp & Paper 632, 662, 668
Quinn, R. G. .....P 691
Rayner, A. F. 656
Reeves, J. S. .....P 684
Reeves, R. E. 633
Reid, M. B. .....P 690
Reininger, H. 630
Renker, A. 673
Reynolds, W. F. 674
Roberts, F. T. 665
Rodriguez, M. G. .....P 681
Rogers, E. 671
Roll, C. W. .....P 684
Roper, A. S. .....P 690
Rowen, J. W. 625
Ruby, A. 646
Rust, J. B. .....P 693
Saarela, M. O. 676
St. Regis Paper Company ..P 685, P 691
Salfisberg, L. L. .....P 686
Salvesen, J. R. .....P 682
Sanders, H. L. .....P 694
Scherer, P. C. 635
Scholander, A. 668, 669
Schulze-Hoetzsch, B. 656
Scruggs, T. M. .....P 687
Shallcross, R. E. 639
Shapiro, J. .....P 684
Shearer, D. McD. .....P 690
Shelton Manufacturing Company .. 663
Shipping Container Institute 664
Signer, R. 634
Simmons, R. H. 660
Smith, G. D. 634
Smith, H. O. 665
Smith, L. E. 645
Smith, S. F. 630
Snyder, F. H. 659
Socony-Vacuum Oil Company .....P 677
Sonders, L. R. 670
Southern Pulp and Paper Manufacturer 654
Spelshouse, W. E. .....P 677
Spencer, R. W. 665
Spiwak, L. 659
Sproull, R. C. .....P 680
Staats, P. L. .....P 680
Stadler, Hurter & Company .....P 685
Staege, S. A. .....P 685
Strain, M. 658
Strange, J. C. 653
Studer, H. 634
Studer, M. 633
Sutcliffe, H. M. 641
Sutherland Paper Company ..657, P 680
Swec, L. F. 650
Swift, F. H. .....P 677
Tanberg, R. .....P 692
Tanghe, L. J. 634
Taylor Instrument Companies 657
Textor, C. K. 646
Thomas, M. .....P 681
Thomasson, N. 662
Timber Engineering Company ....P 694
Tolvi, E. 629
Treadway, R. H. .....P 686
Trobeck, K. G. 626
Turcotte, L. 671
U. S. Secretary of Agriculture .....P 686, P 691
Vahle, R. .....P 682
Van Antwerpen, M. .....P 683
Van der Wyk, A. J. A. 633
Van Horn, H. T. .....P 677
Van Meter, J. L. 654
Vasileff, N. 659
Vilars, J. 658
Vogel, R. E. 629
Vomacka, E. E. .....P 680
Vosters, H. L. 660
Wacek, A. 643
Washington State Pollution Control Commission 667
Wehmhoff, B. L. 660
Weiss, K. T. 673
Weiss, W. 674
West, J. R. 670
Weyl, W. A. 670
Whistler, R. L. 666
White, R. G. .....P 684
Wilcoxson, L. S. 668
Willets, W. R. 649
Williamson, R. V. .....P 691
Wilson, D. L. 660
Wilson, W. C. 650
Winters, R. H. 640
Wright, G. F. 642
Yearian, H. J. 666
Young, F. W. .....P 686
Zweig, S. .....P 687

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